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An Economical System of Construction

Suggested Design for Factory or Warehouse—Efficiency Combined with Low Cost
—Present Time Opportune for Building

BY H. EDSIL BARR*

Present day manufacturers have come to a realization of the large part which the character of their buildings may play in determining their profits and continued or ultimate success.

The manufacturer who makes his beginning in the face of limited capital may be justified in utilizing a frame or an old brick building. The manufacturer, however, who, after becoming established and attaining a measure of success, continues in an old frame building, occupies not only a questionable but a dangerous position. He may at any time, regardless of precautions, experience a fire which will wipe out the results of years—even to the extent of

as indicated by the ample experience of preceding years. The results will be reduced expense for insurance, maintenance, heating, etc., lower costs and increased production, and the net result will be better profits over and above the interest on the new buildings, better satisfied workers, and reasonable safety from total loss of trade from fire, a loss which no insurance money will cover.

These points are accepted facts with intelligent and analytical managers and one of the results has been the modern reinforced concrete building, reasonably fireproof where equipped with a sprinkler system and with the walls mainly of glass. The



A Shop for Light and Heavy Iron Work Which Was Erected at a Cost of 60c. per Sq. Ft. Note the Simple Outline and the Large Window Area

his good will, if his patterns, dies, drawings, special machinery, etc., should require considerable time for renewal. It has been demonstrated that the plant with maximum daylight is vastly more efficient in quality and quantity of production than the plant which is dark. The same is true of adequate ventilation. The excessive cost of handling material in hundreds of old buildings, with the accompanying curtailment of production and consequent high overhead expense, is obviously detrimental from a business standpoint.

In view of the foregoing, it is a fact that the established manufacturer, occupying old and inefficient buildings, should, without delay, provide modern fireproof, maximum daylight housing, specially laid out to meet the conditions of his business

cost of this type building, however, is such as to impose a heavy overhead charge, while it is practically out of the question for the small or moderate sized industry. Furthermore, money invested in buildings, beyond the point of providing the features already advised, ties up capital which should be used in pushing the business. On the other hand many manufacturers who have erected new buildings have on account of the lower cost clung to the old type of solid brick walls, with occasional windows—securing, possibly, many of the desired features of a modern plant but losing the very vital feature of maximum daylight and ventilation.

The accompanying illustrations show a type of construction which has been developed with the express purpose of providing the features of safety from fire, comparative ease of heating, full daylight and ventilation, at a cost completed not greater than

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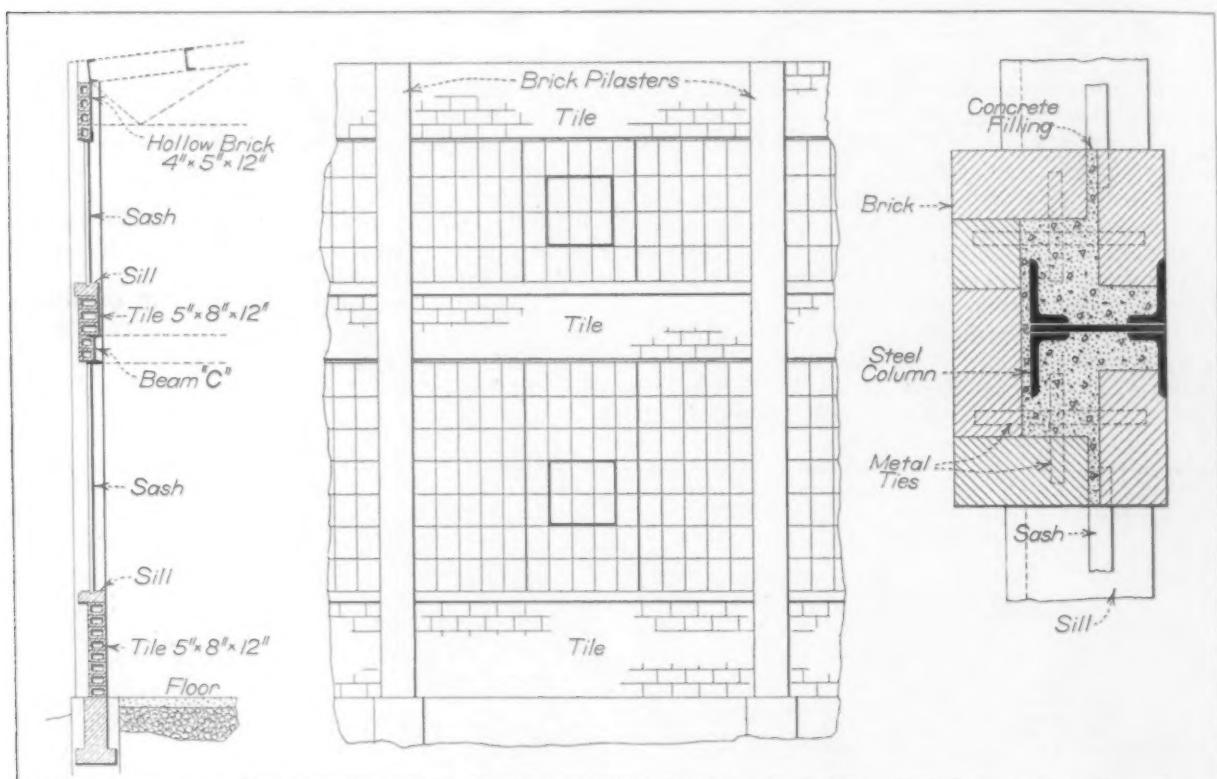
the common brick building with wooden window frames and at half the cost of reinforced concrete, for equal loads carried. It is a system well adapted to either one or multi-storied buildings, factories, shops or warehouses, and has proved very satisfactory where it has already been adopted.

The essential features of the construction are a structural steel frame carrying all loads directly to the foundation, brick pilasters surrounding the outer steel columns, steel window sash with swing ventilators filling the entire space between pilasters, and curtain walls of hollow tile, surmounted by a concrete sill and carrying no load except that of the weight of wall itself, the wall running from pilaster to pilaster. The foundation is of concrete, and consists principally of piers under each column, of a depth depending on the soil conditions, and a light wall section between piers, to carry the tile curtain walls and extending only below the frost line.

the one tile than the six corresponding bricks, and less mortar is needed. In color the tile are either a shade of buff or a dark red, depending on the location and mixture of the clay. In finished appearance, handsome results are obtained without expense by the use of the dark red tile with the lighter red brick pilasters, the buff tile and brick pilasters or the dark tile and buff brick pilasters. These combinations, laid up in black or red mortar, with the white cement sills, give a result not equalled in other materials practical for factory construction and suitable for any location or surroundings.

The curtain walls for the upper floors are carried on a steel member joining the outer columns, while at the roof the wall closure is made by the same tile, 4 in. thick, carried on a steel angle member.

The steel frame follows standard lines, and the hollow tile imposes a comparatively light dead load



Drawing Showing the Outside Appearance of the Walls and Cross-Sections of a Pilaster and the Wall

Sections of pilasters and curtain walls are shown in the drawing, the former being built around the column in hollow form and filled with concrete as the pilaster is built up, corrugated galvanized metal wall ties being laid in the brick joints and into the concrete core to tie the whole together. The weight of the pilaster is carried directly on the foundation pier. Curtain walls are built of hollow, vitreous and impervious tile, a material used extensively for interior fireproofing of modern office buildings and made of a mixture of fire clay and plastic clay, the finished kiln-burned tile possessing great strength and exceptional fire resisting qualities. In numerous severe fires, of public record, this material has shown no disintegration though played upon with fire streams, while plaster on the opposite side of the tile exposed to the flames, was not even cracked. The tile usually employed is 8 in. thick, 5 in. high and 12 in. long, with heavy outside walls and a central wall, such a tile weighing 16 lb. or about 40 per cent. lighter than the six bricks which it equals. It, of course, requires much less time to lay

on it, saving substantially in the weight of steel necessary. The steel frame contains within itself only a fraction of the dead load embodied in a reinforced concrete frame for equal live loads, thus requiring much less expensive foundations. It can be erected in a fraction of the time required for concrete, while the strength of the steel is a positively known quantity unaffected by mixture, methods, etc. The floor beams are located at each column and in the center of the space between columns, where the beam is carried by the same member which carries the light tile curtain wall. The columns are generally spaced 15 ft. on centers, in the length of the building, and the floor beams 7½ ft. on centers, though in a large one-story building the columns may be 20 ft. apart.

The window sash are the now extensively used steel units joined by vertical steel mullions to fill the space desired. The sash have no separate frames and are held at the top by $\frac{1}{4}$ in. hook bolts against a light angle underneath the curtain wall support. At the sides, the sash have frequent

movable lugs, bedded in the brickwork as the latter is built, and at the bottom a deep flange on the sash is bedded into the concrete sill, the whole making a solid, fireproof and weatherproof construction. The cost of these steel sash in quantities is less than that of wood sash and frames, while there is no maintenance cost as the putty is a special litharge composition, applied inside the sash and not subject to deterioration as is ordinary putty on the outside of wood sash. The glass is held in place by metal clips as well as by the putty.

In such a building a sprinkler system is a most profitable investment, and is quickly paid for by the large reduction in insurance rates, the upper floors being of slow burning construction. Yellow pine, 2 x 4 in. and 16 ft. long, is placed on edge on the floor beams and strongly spiked one to the other as laid. Over this is laid crosswise $\frac{7}{8}$ in. matched maple flooring. The result is a solid continuous slab 5 in. thick, without joists, extremely rigid under any loads and practically non-destructible by fire, due to the absence of extensive joist surface or thin sections. This floor weighs only a fraction of the weight of concrete floors, resulting again in economy of steel frame and foundations.

For warehouse construction, requiring few windows, the outer walls are laid of 12-in. or even 16-in. hollow tile, having numerous vertical ribs. Such a wall is capable of carrying any desired loads, has no through joints and is absolutely proof against penetration of frost or condensation of moisture on the inner surfaces whether or not the building is heated. These results have been established in the storage of planished iron gas heaters, where moisture would do great damage by rusting the goods. Where such a building requires to be heated, there is practically no conduction of heat through the hollow tile walls as compared with brick walls, solid or hollow.

In the heating of a building of this type the results are rather surprising in view of the large amount of glass surface. It is found that with the installation of about twelve 1½-in. pipes along the tile curtain walls, underneath the windows, and with the adjustment of the swing ventilators to keep the air fresh and charged with a proper amount of moisture, such a building is kept comfortable with less heat than is required in a frame or brick building of the old style, closely shut up in winter and containing excessively dry air.

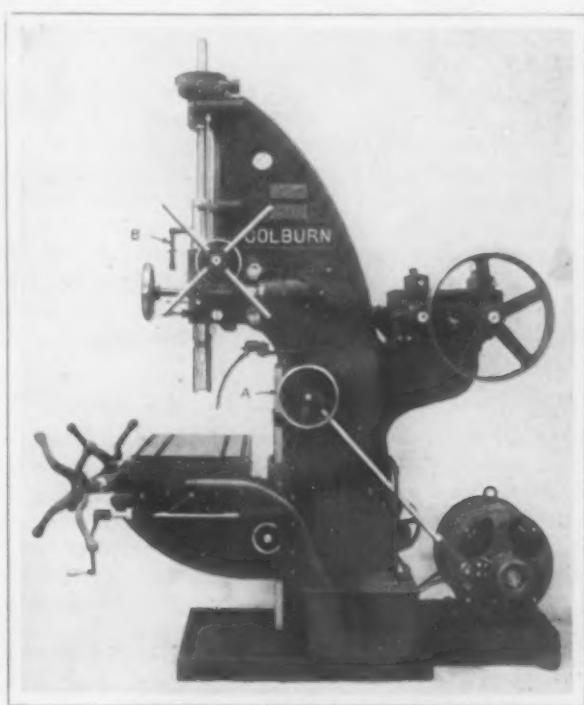
The roof of this system is 1¾-in. matched yellow pine, covered with a 10-yr., non-combustible, guaranteed composition. For warehouse construction, to house very inflammable material, the steel columns and beams are covered with special hollow-tile shapes and the floors above the ground are of hollow tile keyed between the floor beams, with either wood or cement top $\frac{7}{8}$ in. thick. The roof then is of hollow tile 3 in. x 12 in. x 24 in., laid on T-irons, properly spaced, and covered with weatherproof composition.

The net result of this system is an attractive, durable, fireproof, well lighted, well heated and generally efficient building, embodying all that is demanded by present day ideals, at a cost as low as 60c. per sq. ft., which is no greater than that of inferior buildings. Such a building is quickly designed and erected, enabling the manager who is far sighted to meet quickly the demands for increased capacity or efficiency and further to secure complete construction during good weather.

The savings at present possible, because of the very low prices of building materials, will carry an idle building for a year or more, against interest charges on the investment, with the advantage of an immediately available building when business has assumed a normal volume.

Adjustable-Speed Drilling Machine

An interesting example of adjustable-speed motor drive combined with automatic starting control applied to a drilling machine has been made by the Reliance Electric & Engineering Company,



An Upright Drilling Machine Having Both an Adjustable-Speed Motor Drive and Automatic Starting Control

Cleveland, Ohio. The machine is a Colburn D-1 heavy duty drilling machine with compound table. Its drilling capacity is 2 in. in solid steel with high-speed drills.

The machine is driven by a 5-hp. Reliance adjustable-speed motor of the armature shifting design, having a speed range of 450 to 1800 r.p.m. Changes in the motor speeds are obtained by turning the handwheel A which has been placed in a convenient position for the operator. The motor runs at any speed within its range so that it is always possible to adjust the motor speed accurately to suit any combination of drill size, feed and speed.

The starting and stopping of the motor are controlled by an Electric Controller & Mfg. Company's automatic starter through a drum switch mounted on the back of the column. This switch has forward, reverse, drift and brake points. When the switch is thrown to the brake position the motor and drill are automatically brought to a quick stop. The handle B of the drum switch is also provided with a special extension so that it is handy to the operator at the front of the machine.

An Enamel to Prevent Corrosion

A rustproofing guarantee against the corrosion of steel and iron plate and tank work is being made by the Dover Boiler Works, Dover, N. J. It uses what is called bitumastic enamel, manufactured by Wailes, Dove & Co., Ltd., Newcastle-on-Tyne, England, which has been applied extensively in marine construction. An extension of the industrial application of this enamel is now being made. The plates or tanks are first dried by means of a blow torch and then treated with the bitumastic solution to make certain the adherence of the enamel. This material is applied by means of a brush and will withstand, it is stated, a temperature of 100 deg. F.

Practical Facts in Heat Treating Steel*

What Must Be Considered in Heating, Quenching and Tempering Explained by the Problem of Hardening Gears—The Kinds of Furnace

BY R. A. MILLHOLLAND

Assuming that you have, through aid of your test piece, discovered the temperature at which the grain of the steel refines and hardening is possible, make a note of the temperature registered by the pyrometer. This should be in the neighborhood of 1475 to 1550 deg. F., if the pyrometer is indicating correctly. In some few instances, however, you will find that some grades of oil-hardening gear steel harden at lower temperatures. The test pieces will tell exactly where the hardening range of the steel in question lies.

HEATING AND QUENCHING THE GEARS

Now let us turn to the actual hardening and drawing of the oil-hardening gear. In the very first place, let me urge the necessity of treating the steel as carefully as consistent with production demand. It is an old, hard learned trick of the blacksmith to "take the frost out" before he heats a piece of tool steel on a cold morning. The warming or preheating of steel eliminates to a remarkable degree the danger of breakage in quenching and the presence of oil and water checks in hardened steel. Therefore, let me emphasize preheating the gears before raising them to a hardening temperature. Do not go to the elaborate expense of erecting a preheating oven; use the waste space in the furnace you already have. The strip across the furnace 8 in. wide just inside of the door is a good place to preheat the gears. It is best to allow the gears to come to a dull red before they are placed directly in the heating space. After the gears have been preheated it is best to bring them up to the hardening temperature as rapidly as possible, and as soon as the gear becomes thoroughly saturated it should be quenched.

Much damage can be done unless the quenching is done very carefully. Do not jerk the gear out on a rod and throw it into the oil tank. Handle it gently. Pick up the gear on your dipping rod and lower into the bath with a steady even motion, always dipping gears with small hub holes *vertically*. That is, edgewise; for the nearer the gear is dipped in a vertical plane, the less warp will there be in the gear. In small gears up to 6 in. outside diameter, and 2 in. hole in the hub, this method of dipping is highly satisfactory. Raise and lower the cooling gear four or five times slowly in the oil bath, maintaining the same vertical motion used in dipping. This steady motion cools the gear uniformly and minimizes distortion, which in nine cases out of ten is caused by a lack of uniform cooling in quenching. Do not scrub the gear around in the oil or move it in any direction save in the vertical plane.

The reasons for this are many and more complex than might be thought. In the first place, the cooling gear is brought into contact with cold oil on one side only when moving about violently, and the side in the direction of motion will cool more

quickly than the other and the gear is liable to shrink and what is worse shrink unevenly, and the gear will come out of the tank out of round and tapered across the face of the teeth. Violent agitation of the gears is likely to stir up a small amount of water that generally lies at the bottom of every oil tank, no matter how careful one may be trying to avoid having water present in the oil. Wherever water touches a cooling oil-hardening gear, you may reasonably expect to find a crack or surface check. After the gear has been kept in motion for four or five slow motions, lower it gently to the bottom of the basket in the tank. Quench the next gear in just the same manner. Never permit the gears to rest on or near the bottom of the oil tank. Suspend them in the wire basket a few inches from the bottom to prevent them from coming in contact with the water while they are cooling.

Most gears can be dipped in this manner, but where the hole approaches the outside diameter in size, as in the case with some starter ring gears for motor cars, another method has been found by the writer to be a trifle more satisfactory in securing gears with a minimum amount of distortion. Instead of dipping the gear edgewise the gear is laid in a fine wire basket and dipped flat. That is, the entire periphery of the gear strikes the oil at once. The basket is kept moving up and down in the oil, with a steady even motion until the gear has cooled down below a red and then it can be dumped out of the dipping basket to the tank basket.

CONDITIONS WHICH MUST BE AVOIDED

The wires of the dipping basket should be small, so that little or no heat is extracted by them from the hot gear, for if heavy wires are used the gear is likely to be soft wherever the gear touches the wires. The soft spots, though not necessarily detrimental, are often the cause of rejection in the case of a rigid inspection. Much depends on acting swiftly and with dispatch after the gear is heated. The sooner the gear hits the oil after it leaves the furnace the better will be the results, both as to hardness and finish. If the gear came out of the oil perfectly black and hard so that it resists a file the treatment is perfect, provided, of course, there has been no distortion. If the gears come out white and scaly, there is a decarbonized surface and a file bites the corners and edges of the gear but rides when pressure is applied. The underlying surface is hard but the outer surface has been decarbonized from over-exposure to the hardening temperature in an oxidizing plane. To avoid the latter condition the floor of the furnace must be bedded with charcoal and a neutral flame maintained in the furnace. The gear must not be exposed to the hardening temperature any longer than it requires to saturate the gear with heat.

TYPES OF FURNACE FOR HARDENING

For hardening gears, the muffle type furnace is without doubt the best but it is a slow heater and a "fuel hog." The semi-muffle type furnace with the raisable firebrick-lined door is the best all around

*Continued from page 837, *The Iron Age*, April 15. All rights reserved by R. A. Millholland, who is heat treating engineer of the Lyons-Atlas Company, Indianapolis, successor to the builders of the Atlas steam engines and now manufacturer of Diesel oil engines and motor cars. The author's observations are based on five years of experiment, research and study.

furnace for this kind of work. A peep hole in the door will save lots of valuable time lost in cooling the furnace by raising and lowering the door. The fuel question has been fought over so much of late that the writer hardly dares offer his own judgment on the matter, but since we are writing from experience, I say, with some few exceptions, gas is the best fuel to use. It is not the cheapest fuel, but it is the most economical and reliable. The heating space inside of the furnace varies of course with the quantity of production but it is unwise to use more than a 36 x 18 x 12-in. heating space, except on very large gears, for the simple reason that there will be some difficulty encountered in quenching more gears at one time than this size furnace will hold.

The conditions of combustion in the furnace will have a great influence on the quality of the product hardened. An excess of air in the semi-muffle furnace will cause decarbonization and scaling to take place and the product will be of a poor appearance. To avoid scaling resort may be had to one of two measures: Bed the bottom of the furnace with fine charcoal which when heated will give off carbon monoxide gas; this will unite with any excess oxygen in the heating chamber to form carbon dioxide gas, which is inactive on steel. The oxygen having been thus removed from the presence of the heated gears, there will be little or no scale on the work when it comes from the quenching tank.

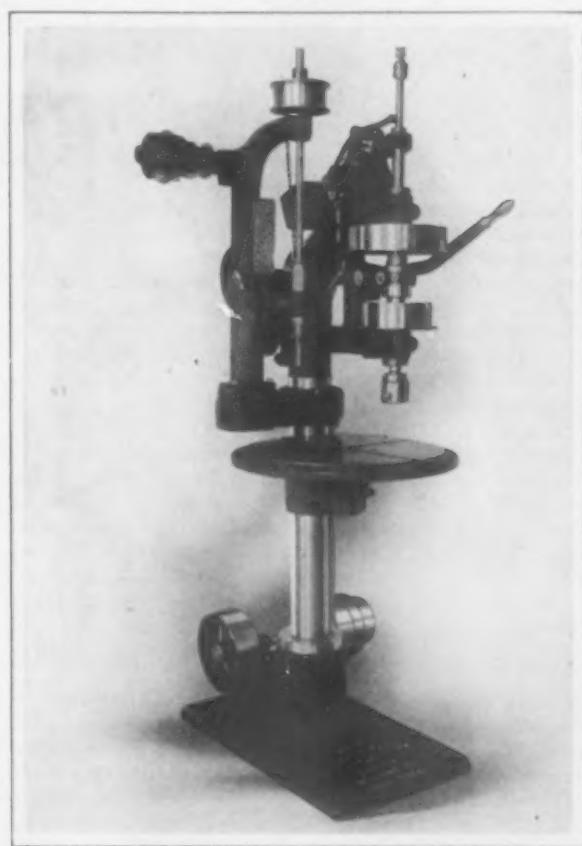
The second method of preventing scaling is by regulating the combustion of the fuel so that a neutral flame is obtained. The term neutral flame of course merely means a flame free from excess air or oxygen. This flame is in evidence in a gas furnace when a semi-visible flame shoots out the pyrometer vent and the chinks in the door. As long as this yellow flame can be seen emanating from the vent and chinks, you may be sure that very little scaling will take place on the parts subjected to heat.

After the gears have been quenched and allowed to grow cold in the tank, they should be drawn to relieve surface strains. In hardening, the oil is not of sufficient density to harden the gears clear through unless they are very thin, and hence there are strains present that must be relieved before the gear can be used without fear of breaking under load. Three hundred and sixty degrees will generally draw the gears sufficiently for ordinary service, but where the gears are subject to very sudden shock, the drawing must be carried to 400 deg.

Undoubtedly the best way to draw gears, or any other hardened parts for that matter, is in a heated oil bath. Heat a tank of oil to the required temperature and maintain it. Place the gears loosely in a wire basket and immerse in the oil. The temperature is measured by a thermometer graduated to 600 deg. Of course when the cold gears are immersed in the lot of oil the temperature of the oil bath will fall until the gears reach the same temperature as the oil. As soon as the oil recovers to its proper temperature, begin to time the drawing operation. Twenty minutes is sufficient for all small gears weighing less than 3 lb. Larger ones take more time. A scleroscope is a useful instrument for governing the amount of drawing required for the gears. Except for clash gears, 65 to 70 deg. Shore is the best gear hardness desirable, and if your gears run over that, raise the temperature of the oil drawing bath and prolong the drawing time. A gear that has been drawn back 5 to 10 points on the scleroscope will be tougher and stronger than an undrawn gear of corresponding hardness, all other conditions being equal.

Automatic Drilling and Tapping Machine

The Garvin Machine Company, Spring and Varick streets, New York City, has added a combination drilling and automatic tapping machine to its line of automatic tapping machines. With this



A Combination Drilling and Automatic Tapping Machine That Allows Holes Up to a Maximum of $\frac{1}{4}$ In. to be Drilled and Tapped in One Machine

machine it is possible to drill and tap work on the one machine without having to remove it from the drilling machine and take it to a second machine to have the holes tapped.

The drilling head is applied to the company's standard No. 2 automatic tapping machine, which was illustrated in *The Iron Age*, December 24, 1914. It is driven by a separate countershaft and has a capacity for driving a $\frac{1}{2}$ -in. drill. The tapping machine will drive U. S. standard taps, ranging from $\frac{1}{4}$ to $\frac{3}{4}$ in. in diameter, in cast iron. The tapping spindle is fitted with two friction pulleys running in opposite directions, and once the tap is started the machine will work automatically to tap the holes to a predetermined depth. An automatic trip operates when the hole is tapped to the proper depth to reverse the tap.

Early Use of Safety Goggles

The earliest record of systematic eye protection, according to G. W. Keller of T. A. Willson & Co., Inc., Reading, Pa., is that of the Crane Company, Chicago, which in 1897 began to provide eye protectors for its men. In 1898 the company put this work on a systematic basis, giving the glasses to the men free of charge, and requiring operators, as far as possible at that time, to wear the glasses constantly when they were exposed to flying bits of metal, emery, or to glare and hot metal. Dr. A. M. Harvey, who is still chief surgeon of the company, was the originator of the plan. The Crane Company posted signs conspicuously at various points in the shop, drawing the attention of the men to the necessity of using glasses and the fact that the glasses were provided by the company without cost.

National Metal Trades Association Meeting

Keynote of Last Week's Annual Meeting in New York the Establishment of Conference Boards of Employers' Associations. The Object of These Is to Carry On the Training of Apprentices, to Study Legislation, to Improve Factory Conditions and to Take Up Other Industrial Problems, Especially Those of Politics

Another step in the evolution of associated effort was developed at the annual meeting of the National Metal Trades Association held at the Hotel Astor, New York, on Wednesday and Thursday of last week, April 14 and 15. It amounts to the establishment of conference boards made up of representatives of more or less allied employers' associations. The first of these conference boards brought into being a little over a year ago the co-operative movement to standardize safety and sanitation practice, conducted under the name "National Affiliated Safety Organizations," and the idea has been seized on to further more rapidly than might otherwise be possible the training of apprentices and to co-ordinate the efforts of employers to bring the influence of business men to bear on legislation. John D. Hibbard paid special attention to the subject in his report as commissioner, as did W. A. Viall in his report as chairman of the association's apprenticeship committee, and M. W. Alexander in an address at the Wednesday afternoon session.

THE CO-OPERATIVE MOVEMENT AMONG ASSOCIATIONS

"The movement which was started last year for a more harmonious and intelligent co-operation on the part of national associations," said Mr. Hibbard, "and which found expression in the National Affiliated Safety Organizations, co-ordinating the efforts of the National Association of Manufacturers, the National Founders' Association, the National Electric Light Association, and our own association, has been extended and your officers are now members of two other similar conference boards; namely, the Joint Committee of Associated Employers and the Conference Board on Training of Apprentices; these bringing us into close relations with the National Erectors' Association, the United Typothetae of America, the American Anti-Boycott Association, the National Machine Tool Builders' Association, as well as those mentioned before. This whole movement is most significant, and many results of prime and far-reaching importance are anticipated. Never before have these powerful organizations been so effectively united, and never before was such joint action, as may now be expected, possible. This movement is also reflected in the formation and active operation of associated employers of the various states, notably Missouri and Illinois, where it has been found that the only way to oppose effectively state legislation of a character dangerous to legitimate business has been to organize politically militant associations."

CONFERENCE BOARD ON TRAINING APPRENTICES

The apprenticeship committee report, which was signed by W. A. Viall, Brown & Sharp Mfg. Company, Providence; R. K. LeBlond, R. K. LeBlond Machine Tool Company, Cincinnati, and F. S. North, Union Special Machine Company, Chicago, called attention to the fact that at the annual meeting in 1913, it was voted that the National Metal Trades Association employ a man to assist in the organization of an apprenticeship system in the shops of its members. The committee expressed regret that the man was not discovered. "We are not losing sight of the fact," says the report, "that modern conditions, in fact, the conditions of the last four or five years, are changing to such an extent that the specialist is coming more and more into vogue: but despite this, there is ever present the demand for the all-round skilled workman." The committee asked for help in finding the man "who is in sympathy with training methods; who has the breadth of vision that will allow him to go into shops and suggest organizations

that will not upset all existing work being done: in short, a man of a thoroughly attractive type; this attractive element to be combined with tact."

The remainder of the report was in part as follows: "Stimulated by the results that the Conference Board on Safety and Sanitation has accomplished in the year of its existence, Mr. M. W. Alexander called together representatives of the various bodies that have been interested in apprenticeship work with the object of forming, if possible, a Conference Board on Training of Apprentices. Representatives were present from the National Association of Manufacturers, the National Founders' Association, the National Metal Trades Association, the United Typothetae of America and the National Machine Tool Builders' Association.

"The plan to be carried out is that the associations mentioned shall appoint their president and two members of its body as members of this board: that they shall consider the various ideas brought before them; and, in an informal yet in a thoroughly painstaking and careful way, recommend those plans that seem to be best adapted to meet the demands of the special body that is considering the apprenticeship question.

"The work that the United Typothetae of America is doing in systematizing an apprenticeship system was a revelation to those who were present, and they have brought out many facts which show conclusively that we have a common cause up to a certain point in connection with the training of boys. Whether the prospective apprentice is to enter the building trade, printing trade, machine-tool trade or other lines, we look for a certain course of preliminary knowledge and of schooling; and here we believe there are opportunities of formulating requirements that will raise the dignity of the apprentice in every trade."

The recommendations of the apprenticeship committee were reviewed in *The Iron Age* of April 15 together with the reports presented in the Wednesday morning session, and the resolution which grew out of the report and was adopted on Thursday was as follows:

Resolved: That the National Metal Trades Association authorizes the participation of a committee with the Conference Board on Training of Apprentices, and that the executive committee allow the necessary dues, and the expenses of such committee, provided said executive committee, upon investigation, approves the work of the Conference Board on Training of Apprentices.

CONFERENCE BOARD'S WORK IN SAFETY

Magnus W. Alexander, who spoke at the Wednesday afternoon session on "Co-operation of National Employers' Associations through Conference Boards," said in part:

New social relationship and new methods of production have created new problems in management. To meet these problems the best thought is necessary. The industrial army is growing and legislative activities are increasing. It is the fashion of the day to attack successful business and to insinuate selfish motives to manufacturers. This has made the management of manufacturing industries a stupendous problem. Though great, it must be dealt with broadly and unselfishly. Each employer in each industry has peculiar problems. When traced back to their origin they all spring from the same source of omission and commission. They need broad corrective treatment. The extent to which these problems will have a right solution depends on the get-together spirit of all concerned.

Safety and sanitation is not a new idea. It became big when viewed under modern conditions. The effort to make it an idea of new origin is wrong. Working in

this field in many parts of the country, there were many engaged on the same problems. A solution was offered in two different places, both good and efficient, rendering it hard to select one of them. There arose from these conditions an unnecessary duplication. Hence steps were taken to overcome this, which resulted in the Buffalo meeting a year ago of a number of men who represented five to six million employees. From this was formed the Conference Board on Safety and Sanitation. To this board comes a vast fund of valuable information from a great variety of industries. The suggested devices and remedies are all tried out by the board and recommended to employers belonging to the various employers associations. Nothing is decided on except unanimously. Each device or formula sent out bears the stamp, "N. A. S. O." standing for National Affiliated Safety Organizations. Devices are sold at cost price, the board being interested not in making money but in solving problems.

The board has received many letters in praise of its protective devices and it has been turned to often for advice. Its bulletins have been enacted by the Minnesota Labor Commission into the State's standards. After one year's work and only five meetings, the board has laid out a programme for the coming year. It represents the accumulated judgment of a large body of men.

GOOD LIGHT AND VENTILATION

The question of good light, an important safety factor and a difficult problem in foundries, was placed before the board by the National Founders' Association. Letters were sent out to foundries and machine shops as to what had been done in this line. This work has resulted in the drawing up of two bulletins, one on natural light and one on artificial light. The first has been issued and sent abroad. The second has been passed and approved.

The ventilation problem has been taken up, always a difficult one. The board's inspector has been sent on a trip of investigation and 150 letters have been dispatched. The work has been conducted carefully and systematically and the board has found universal approval.

BULLETINS ON FIRST AID

Speaking of the bulletin on first aid to the injured, Mr. Alexander said that, as all accidents cannot be eliminated, the establishing of a corps of first aid men was recommended. A meeting of 15 physicians from as many corporations was held last year from which conference there resulted the issuing of 10,000 pamphlets covering recommendations to fit this problem. Eighteen doctors recently met to review the work of the last year and to formulate joint action for the benefit of all. Questions of the effects of decayed teeth, eye strain and incipient tuberculosis are being taken up, and even of certain phases of workmen's compensation laws. For example, in Indiana, the liability of an employer begins with the day of the injury, but if no notice is given in 30 days, liability ceases. But if during that time a workman declares he has suffered back strain while working and demands compensation, no doctor can certify that he does not suffer as he swears. The only remedy for this disease of so-called "compensitis" is compensation. A recent conference in New York of 25 prominent physicians has redounded to great benefit.

The formation of a conference board on the training of apprentices is being pushed. In various fields independent workers have made no great progress in this problem. Much good is being done, but the work is not properly correlated or presented. How fundamental it is that various industries be brought together in this problem and that there be one programme for all industries!

A CONFERENCE BOARD ON LAWS

But there is one thing more fundamental still—How shall we be allowed to carry on our business? A conference board on legislative methods is necessary and even planned and hoped for. The sixty-third Congress entertained 40,000 bills and enacted 700 laws; 48

legislatures have also done their work. Last year 4000 legislators passed 43,400 pages of laws. Various states are passing or considering compensation laws; other problems, like the minimum wage, are demanding consideration and co-operation of employers and associations. It is a waste of time and effort to do this in each state. Co-operation is necessary, for in union there is strength. At the same time it is a patriotic duty.

THE BUSINESS MAN IN POLITICS

In the absence of Dudley Taylor, who was to present a paper on "State Legislation and the Business Man," the chairman of the afternoon called upon P. W. Gates, president Hanna Engineering Works, Chicago, to discuss the topic.

Mr. Gates said that in Illinois it became recognized that legislation was assuming such shape that business men must get into politics. So a few men two years ago formed the Allied Business Men of Illinois. Its object was to consider legislation that was oppressive or likely to become so. It was evident that the only way to combat this problem was to get all the Illinois associations to join under one head; that they were not prepared to cope with the other side; that labor had lobbies.

A majority of the business men knew very little of legislative conditions, even did not know the representatives from their own district. They got together, employed an attorney and are investigating every act of the legislature as well as conducting a campaign of education. The recent eight-hour bill was postponed and its inimical effects presented to the lawmakers. District committees are formed now and candidates are watched and fruitful results are already apparent.

W. A. Layman, Wagner Electric Mfg. Company, St. Louis, told briefly what had been done in Missouri. He stated that, partly through the example of Illinois, the same results had been accomplished in Missouri. As a result of the work of the Associated Employers of Missouri no labor bill was enacted by the legislature just adjourned and the movement was started only a few months before the legislature opened its session.

As an illustration of how things are happening in Missouri Mr. Layman cited the insurance muddle, whereby insurance companies had been driven from the state; the loss of a large amount of money by a fire caused a change in the law and the companies were now again doing business. In the anti-Standard Oil legislation, one town was completely deprived of its industries by the compulsory closing of its oil industry; the attorney-general declared the law unconstitutional and the town's activities were resumed. Everyone knows the result of the vote on the full-crew law. A change has come over the spirit of the people and the business man has entered politics.

Theodore Vilter, Vilter Mfg. Company, Milwaukee, recited how the social democrats had been removed from power in that city by a combination of republicans and democrats. From this has grown the formation of the Milwaukee Metal Trades and Founders' Association, which is investigating all political problems and acts of the legislature, its committee meeting every Saturday night. A business man has been elected Governor of the State and his inauguration was attended by the largest delegation of business men in the history of the State.

By invitation of the chairman, Howard P. Eells, Bucyrus Company, Cleveland, Ohio, a former president of the association, said how very much in his mind had been the importance and efficiency of the backing of the business man as brought out not only by Mr. Gates and Mr. Layman, but also by Mr. Alexander. He believed that one thing this country needs, that our administration needs, is the support and backing of business men. The time is coming when a President of the United States will have the backing of the business men.

Walt. S. Goodwin closed the afternoon programme with an address on "The Highways and Hedges of Many Managers of Men." It was a portrayal of the many characters that are met with among factory

foremen, and the reasons why they never reach the value which they should attain because of individual faults of disposition, character and intellect. The various types were graphically and amusingly illustrated on the blackboard by the speaker.

LABOR AND ANTI-TRUST LEGISLATION

At the opening of the last session Mr. Rice read a telegram of felicitation from the California Metal Trades Association. He then paid a tribute to Daniel Davenport for his service to American industry, particularly in the Danbury Hatters' case.

Mr. Davenport, who addressed the meeting, recalled that he first came in contact with the National Metal Trades Association 12 years ago when he participated in a meeting at Buffalo. He gave a succinct account of the Danbury case, and of the legal vicissitudes it went through. The two great points which it was sought to demonstrate were whether the Sherman anti-trust act meant what it said and whether individual members of a trade union were liable for the acts of its officers. Particular satisfaction, he said, is derived from the action of the courts in sustaining the latter.

Mr. Davenport told of the years of effort to secure legislation removing labor unions from the operations of the Sherman anti-trust act, and culminating in the Clayton bill, now law. He said in this connection that a case pending in the United States Supreme Court and about to be argued is expected to bring about a construction of the Clayton act. It is contended that the act does not change any existing law. The complaint is that certain manufacturers of wood trim cannot do business in New York for the reason that another group of manufacturers hire none but union carpenters, who will install nothing but union-made trim. A decision is expected this summer. Mr. Davenport said that everything is working around to the principle of the open shop and that "when the clouds roll by, I think we shall find this a free country once more."

WHAT FROM INDUSTRIAL RELATIONS COMMISSION?

Walter Drew, of the National Erectors' Association, New York, told of the co-operation by a joint committee of his association, the National Metal Trades Association and the National Association of Manufacturers, with the Federal Commission on Industrial Relations and of the latter's investigations and hearings which have been conducted in various cities. He recalled the fact that the commission owes its inception to social workers who believed that unlawfulness on the part of labor might be traced to unfair treatment of it. He said the commission had been held in distrust and apprehension, and, he believed, without foundation. He said that it was the part of wisdom to work with the commission instead of against it, inasmuch as manufacturers have nothing to conceal. He held the open-shop movement to be a benefit to industry at large and that a proper understanding of it by the general public was the great need. If this could be accomplished by an investigation, it should be welcomed, even though the investigation might be regarded by some as hostile and partisan. He said that one fact which had been brought out in the hearings was the lack of civil responsibility of a union for its acts, and the inability to recover from its funds. The fact of power without responsibility had been repeatedly driven home. The future of the commission and the appearance of its report is a matter of uncertainty because of a shortage of funds which had led to some disintegration of the commission's organization.

ELECTION OF OFFICERS

F. K. Copeland, Sullivan Machinery Company, Chicago, took the chair to receive the report of the nominating committee, F. C. Caldwell, chairman. The latter said it had been decided to abandon precedent in selecting a president and to renominate Mr. Rice, not only for the reason that his work as president had been so satisfactory, but because there was a feeling that with a one-year term a president relinquishes his office just when he had become thoroughly conversant

with its duties and capable of rendering the best service. Mr. Caldwell was ardent in his tribute to Mr. Rice's capacity for work. Mr. Rice was elected without opposition.

Other officers were elected, as follows:

First vice-president, George Mesta, Mesta Machine Company, Pittsburgh.

Second vice-president, W. H. Van Dervoort, Root & Van Dervoort Engineering Company, East Moline, Ill.

Treasurer, F. C. Caldwell, H. W. Caldwell & Son Company, Chicago.

Councilors for two years: W. A. Layman, Wagner Electric Mfg. Company, St. Louis; Paul B. Kendig, Seneca Falls Mfg. Company, Seneca Falls, N. Y.; J. W. Higgins, Worcester Pressed Steel Company, Worcester, Mass.; M. B. McLaughlin, Geo. T. McLaughlin Company, Boston; Justus H. Schwacke, William Sellers & Co., Inc., Philadelphia; Henry D. Sharpe, Brown & Sharpe Mfg. Co., Providence, R. I.

Honorary member, M. H. Barker, American Tool & Machine Company, Boston, Mass.

Mr. Rice made a brief speech in appreciation of the honor conferred on him, as did several of the other officers. Mr. Mesta was not present. Mr. Rice, in his remarks, expressed his appreciation of the work of Commissioner John D. Hibbard and of Secretary Homer D. Sayre. He said the association had an organization which would be a credit to any business establishment.

INDUSTRIAL EDUCATION

The report on industrial education, read as mentioned in last week's issue by H. B. Kennedy, was in part as follows:

The Board of Education of Pittsburgh has agreed to assign 8 teachers to part-time instruction to be established in the public schools in co-operation with employers.

In Indiana they have established since last September 34 State-aided vocational schools with 4020 pupils enrolled.

In Providence, R. I., the city authorities have secured an efficient instructor to supervise industrial education in the public schools with the co-operation of employers.

Connecticut has established a plan for maintaining or assisting in the maintenance of industrial schools carried on by local communities under certain conditions, the administration being carried on through the office of the secretary of the State board of education.

A bill providing for industrial education has been passed by the legislature of West Virginia.

A bill providing for a commission to study vocational education has been introduced in the Delaware legislature.

California has taken up the subject of vocational education by appointment of a commission on vocation education.

Minneapolis, Minn., received a bequest of over \$2,000,000 for establishing and maintaining an industrial school wherein shall be taught industrial and mechanical arts.

New York City is at present making a most noteworthy attempt to give young people who are not training for college a training for life. Dean Herman Schneider of the University of Cincinnati has been retained by the city of New York to work out plans for a system of co-operating and continuation courses in the public schools and industries of New York, based upon similar schemes which have been successfully conducted under his direction in Cincinnati.

An important event of the year on vocational education was the appointment by President Wilson, pursuant to act of Congress approved January 20, 1914, of a commission of nine members "to consider the subject of national aid for vocational education and report their findings and recommendations not later than June 1." The Commission made its report to Congress, after six weeks of activity that included a number of public hearings, conferences, etc., at a total expenditure of \$10,000, although \$15,000 had been appropriated. It is intended to bring the matter up for renewed con-

sideration at the first session of the Congress which begins in December, 1915. The following gives in condensed form the recommendations of the commission:

That national grants be given to the States for the purpose of stimulating vocational education in agriculture and the trades and industries, and that these grants be given in two forms:

For the training of teachers of agricultural, trade and industrial and home economics subjects; for paying part of the salaries of teachers, supervisors and directors of agricultural subjects and of teachers of trade and industrial subjects.

That appropriations also be made to a Federal board for making studies and investigations which shall be of use in vocational schools, as follows: For salaries of teachers, supervisors and directors of agricultural, trade and industrial subjects, \$1,000,000 for fiscal year 1915-16 until a maximum of \$6,000,000 is reached in 1923-24. For the training of teachers of agricultural trade and industrial and home economics subjects, the sum of \$500,000 for fiscal year 1915-16 up to \$1,000,000 in 1918-19 and annually thereafter. For the work of the Federal board for administering grants and furnishing information and advice to the States, an appropriation of \$200,000 annually.

The maximum in each case is continued annually thereafter. The schools to be aided are of three kinds—all-day schools, part-time schools, and evening schools, to prepare boys and girls over 14 years of age for employment in agriculture, trades and industries.

THE BANQUET

The annual banquet on the evening of April 14, at the Hotel Astor, was unusually well attended. President Rice presided and introduced the two speakers, Frederick P. Fish, of Boston, and Alfred W. Martin, of the Ethical Culture Society, New York City.

Referring to present day efforts to ameliorate the lot of the laboring class, Mr. Rice said that in his opinion it was of far more importance to get the drones among workingmen up to the highest point of efficiency than getting the majority down to the lowest possible number of hours. He said there is no value in reducing hours of labor to a point lower than health demands, but, on the contrary, most of the good in the world has come from doing more work than is necessary. Of course, it must be realized that many persons work too hard and too long for their own good, but there also are a great many who don't work enough. The need of recreation was to be recognized, of course.

ATTITUDE TOWARD BUSINESS MEN CHANGING

Mr. Fish began with a brief survey of the industrial and business achievements of the fifty years dating from Lincoln's death. He touched on many matters of concern to business and deplored the criticisms which had been enunciated from pulpit and platform, in private circles and in the press and cheap magazines. He pointed out that this is a day of extremes, not only in the attitude in which business men have been regarded, but in other directions, such as art, music and literature, all indicating that the human mind is sometimes carried away by ideas not in consonance with sound sense. This condition might be due to the fact that people are thinking too hard. All of the worst existent today is matched, or offset, he said, by progress for good never before equalled, and with the latter no man who has red blood in his veins can fail to be in sympathy.

Were Shakespeare alive today, Mr. Fish said he doubted that the great poet would be writing books, and Michael Angelo, if he were here, probably would be designing or building great water power projects in the west.

Years ago people had great respect for the man who could make two blades of grass grow where one grew before. Manufacturers and business men are accomplishing things as great, yet there has been a tendency to regard them, not as benefactors, but as criminals. Mr. Fish said the time is ripe for a reaction from this mode of thought. He declared the standards of business men to be higher than required by the law and in proof of his assertion he mentioned the usual fidelity to verbal contracts, the abhorrence of lying and the willing acceptance of cancellations where the enforcement of a contract would impose great hardship.

Describing the difficulties which beset the course of

business men he told of an instance where a legislator who had framed a law and himself a lawyer, had advised clients that a certain agreement would not be in violation of the law, yet they were later subjected to a fine. As for the Clayton act, he said it means an era of uncertainty and discouragement. In place of the Federal trade commission bill, which stipulates that all unfair methods of competition are unlawful, Mr. Fish said that a law might as well be passed to say that all men must be good. In innumerable cases the question of what constitutes unfair competition can only be determined by a superhuman man, yet the determination had been left to a body of five men, whose abilities he would leave to his audience. Alluding to the Interstate Commerce Commission, he said that so far as he could see it had been helpful in only one respect—it had helped the railroads to see their mistakes quicker than they otherwise would have done. Considering the innumerable differences in business, he could not see how a body like the Federal Trade Commission could grasp them. A thousand commissions would not be too many to be in touch with industry as a whole. If anything is sure, it is that the commission will make mistakes. In the matter of trade agreements, the first question which should be asked is whether there is anything in them which is harmful to the public interest, a policy from which great good would come.

Mr. Fish said that with all the inveighing against rebates the government itself is giving rebates to department stores and mail order houses through the medium of the parcel post. He intimated that the government should not give undue advantage to private business interests, while admitting that economic laws must prevail.

Mr. Martin said he had studied the by-laws, constitution and principles of the National Metal Trade Association and in them had found only things commendable. He said they contained more consideration for the toiler than was encompassed in any of the great writings of previous eras. He alluded to the interest of the association in safety and sanitation, educational work, right of employment and means of finding it afforded to the willing worker, and to other activities of the association. He also traced the changes in the status of business men in the past.

A good dinner was made more enjoyable by an excellent vocal quartet. Not to be omitted is mention of the songs by Theodore H. Vilter, Vilter Mfg. Company, Milwaukee, Wis., for which he is justly famous. The diners were neutral, for both "It's a Long Way to Tipperary" and "Die Wacht am Rhein" were sung with vigor by everybody.

Erie's Engine and Boiler Works

The April issue of the Erie Magazine, which is published quarterly by the Erie Board of Commerce, Erie, Pa., in its leading article features the importance of that city in the manufacture of engines and boilers. Erie has for many years been termed "the engine and boiler town." By the records of the Hartford Steam Boiler Inspection & Insurance Company, which covers 35 years, Erie has manufactured more steam boilers than any other city in the union. This special branch of Erie's industry was begun about 75 years ago when a small foundry was established which was the beginning of what has since become the Erie City Iron Works, now among the largest establishments in the world devoted to the manufacture of engines and boilers. Other local manufacturers in these lines are the Bay State Iron Works, Bay State Machine Company, Skinner Engine Company, Nagle Engine & Boiler Works, Nagle-Corliss Engine Company, Erie Engine Works, Union Iron Works, Ball Engine Company, Erie Mfg. & Supply Company, Erie Machine Shop, Heisler Locomotive Works, Fulton Mfg. Company, Erie Pump & Engine Works, Pennsylvania Boiler Works and American Boiler Works.

The Morgan Engineering Company, Alliance, Ohio, has taken an order from the Youngstown Iron & Steel Company for the crane equipment for its new steel plant.

Prostration of Belgian Industry Is Complete

Contrasting Aspect of the Famous Valley of the Meuse Now and Before the War—Conditions in the Districts of Liege and Namur

BY DAVID ELLIOTT SASSEEN

Tourists always have found one of the most interesting sections of Europe to be the picturesque valley of the Meuse, and up to the outbreak of hostilities between the great powers this had also been one of the richest and most prosperous sections of Europe, or of almost any part of the world. The valley extends from Vise on the Holland border southwest through the provinces of Liege and Namur to the French border. From one end to the other the valley of the Meuse was remarkably attractive in its scenery. Bold cliffs, ruined castles, rich pastures and thriving cities, towns and villages, followed one another in such rapid and uninterrupted succession that for a great part of the distance, particularly between Liege and Namur, it gave the aspect of one town or city, so densely was it populated. Before the war, everywhere the eye was met by lofty chimneys of factories and the bustle of coal mines, which attested the enterprising character of the people.

The valley, like all parts of Belgium, was extremely fertile. Agriculture vied with manufacture for supremacy. The rich plateau that stretched to the north and west from the banks of the Meuse waved with its golden harvest every year, while meadows brought abundance of fodder for horses and cattle. It is safe to say that hardly an acre of uncultivated land, where that land was tillable, could be found in the entire kingdom, and the naturally beautiful scenery was diversified with gardens, cornfields and, in certain sections, vineyards. Now the entire aspect of the valley of the Meuse, as the writer found in a trip of several weeks ago, has been changed. It is the center of the tremendous contest between the armies of the warring nations. The hundreds of tall chimneys no longer send clouds of smoke into the air; the machinery is silent, and hundreds of thousands of skilled artisans in the district are idle.

Belgium's commerce was vast, considering the size of the country. Its imports in 1912 were \$956,896,000 and its exports were \$762,635,000. Its imports from the United States were \$79,869,000 and its exports to this country \$28,010,000. It had 5402 miles of railroad under State control.

COAL AND IRON INDUSTRIES

One of the great sources of Belgium's prosperity was her very considerable mineral wealth, more especially coal, which was known to exist in Hainault early in the 18th century, although it was not until the end of the Dutch rule that steps were taken to exploit the mines in a serious fashion. The last complete census showed that there were employed in the mines 128,313 men and women, while in the iron and steel works 134,333 workmen were employed. Above ground, 5083 women and 3039 girls were employed in the mines, but few underground. Their wages averaged 1417 francs a year—a little less than \$300. The production of coal has been around 25,000,000 metric tons a year in recent years, but more has been consumed, the imports exceeding exports by 1,000,000 to 2,000,000 tons a year.

Labor was so fully organized on militant lines in Hainault and the Liege districts and restriction of output had so firm a hold on the workmen's minds that there was little prospect of any great increase in the output, despite the fact that new coal fields in the region known as Campine, a barren moorland in the province of Limburg, were known to be very rich in their coal deposits.

Belgium has practically no iron ore, her mines having been worked out long since, and depends upon foreign sources of supply. The imports have been around 6,000,000 tons a year. Pig iron production has been about 2,250,000 tons a year, and pig iron imports, 700,000 tons. In recent years the steel output has been somewhat above 2,000,000 tons of ingots. Textile manufacture has been a great source of revenue. In 1912 there were 1,372,000 cotton spindles at work.

Canals have always proved of vast importance in the commerce of Belgium. While not as numerous as those of Holland, they are highly important in the transportation of coal and manufactured products. The rivers, particularly the Meuse, Scheldt, Lyse, Dendre and Dyle, are nearly all canalized, making them navigable throughout the entire kingdom. There are, or were, in Belgium 52 separate canal systems with a total of about 1020 miles, in addition to which were five ship canals with a total length of about 100 miles. The Meuse, partly French and partly a Dutch river, is in many respects the most important of all the Belgian waterways because of its connections.

THE LIEGE-NAMUR DISTRICT

Liege, the capital of the Walloon district, is the center of the great manufacturing section of the valley of the Meuse, which has been called the garden spot of the world. With cheap transportation from the French iron districts, it was a formidable competitor of Germany or Luxemburg. The city has a population of 174,000. The river flows through the city and dividing forms an island which is connected with the right bank by five bridges and with the left bank by six bridges, in addition to a small foot bridge. East of the river are the factories, rolling mills, machine shops and the homes of a great majority of the artisans employed in them. West of the river is the principal part of the city, including the banks, churches, theaters, museums and best residential sections. In the suburban town of Seraing, to which Liege is connected by a suspension bridge, are the great Cockerill steel works, which employ 10,000 men. The city of Liege has been likened by many to Pittsburgh in this country. Its industries are chiefly coal mining and the manufacture of steel products. Up to the war Liege and its environs were counted one of the most important industrial districts in Europe. It was famous for the manufacture of guns and munitions of war, and was known as a producer of arms long before the invention of gunpowder.

From Liege to Namur has always been considered a great strategic district, the gateway of the

nation, and a chain of twelve forts encircled the city of Liege, while Namur, $37\frac{1}{2}$ miles distant, was almost as strongly fortified. The fortifications around Liege cost more than \$20,000,000, and, although Belgium was recognized as neutral nation, these fortifications were kept up to defend the kingdom from possible invasion.

Namur is a very important city of 32,000 inhabitants and is picturesquely situated at the confluence of the Sambre and Meuse rivers. Its strategic importance was quite as great as that of Liege and it was an important link in the chain of fortifications along the Meuse. It was encircled by nine detached forts, which extended to the east and toward the south half way to Dinant, another rich town in the valley, $17\frac{1}{2}$ miles south of Namur and very near to the French border. In the Meuse valley also is the wealthy town of Huy. Namur has been likened in a way to Paris—a small Paris, of course—but it takes its place among the most important cities in Belgium. More than a score of other towns and villages are situated along the banks of the Meuse river, and these as well as the larger cities and towns were active in manufacturing and in agricultural production.

Labor was never very highly paid in Belgium, although skilled labor always commanded compensation great enough to enable the people to live well and to save money. They worked on an average of nine to ten hours a day, although in some branches twelve hours was a day's labor.

THE DESOLATION OF TODAY

Americans can only realize the desolation of this wonderful industrial section by a comparison. The coal mining districts of the United States and the steel producing sections are the greatest in the world, but it must be remembered that the population of the United States is about 100,000,000 as compared with 7,500,000 in Belgium. Conditions in the great valley of the Meuse are therefore very similar to what conditions throughout the state of Pennsylvania, the Lake Superior iron mining regions and the coal districts of Indiana, Ohio and Illinois would be if all the coal and iron industries were to be stopped entirely. In proportion to the population, the distress is even greater, because in the United States if any section had its industries completely paralyzed, the wealth and charity of the remainder of the country would come to the rescue and the people would not be allowed to starve. Conditions in Belgium are such as could hardly be conceived in the United States.

Completely hemmed in by the belligerents of three nations, the whole seven millions of people of Belgium have had their food supply completely cut off. There is no food in the country except that which is imported and there is no other source through which the Belgians can obtain food than the Commission for Relief in Belgium, 71 Broadway, New York, which by full agreement between the powers is permitted to carry food to the starving inhabitants of the country. This food, a great part of which is paid for by the Belgians themselves (those who are able to pay being compelled to do so, while free food is provided only to the absolutely destitute) is carried to Rotterdam, Holland, in ships that fly the flag of the Relief Commission, a flag that is respected by all the powers.

The United States leads the world in this great charity and no doubt will continue to do so as long as the necessity exists. Other nations have given generously. Canada and Australia have come to the rescue of the poor in Belgium and have done nobly. Very few notable contributions have been

made from other neutral countries, with the exception of Holland, which has harbored more than 200,000 of the refugees from Belgium, and is doing all in her power to feed them.

A High-Speed Drill with Greater Twist

The Detroit Twist Drill Company, 634 Fort street West, Detroit, Mich., has brought out a new high-speed twist drill. The special feature of the drill is the use of a greater angle of twist than formerly. With the employment of this increased angle of twist larger chip space and a longer life are claimed.

In the Detroit drill the angle of twist has been increased from 25 deg. at the point and 20 deg. at the shank to 32 deg. at the point and 25 deg. toward the shank. The contrast between the old angle and the new one is brought out in the accompanying illustration. The line AA in each case represents the center line of the drill, the cutting point being at O. The line BB is tangent to the flute at the cutting edge and CC is the tangent near the shank, GOE being the angle of the cutting edge,



Drawing Showing the Contrast between the Angle of Twist Used in a Recently Developed High-Speed Twist Drill and That Formerly Employed

which is usually known as the clearance angle. This angle has been placed by common practice at about 12 deg., although it is entirely in the hands of the man who does the grinding. The clearance is indicated by the line OE, drawn at right angles to the center of the drill. If a line is drawn to the left of the line OE, so that at a distance of 3 in. from O it is inclined about 0.008 in. to the left, it will represent the ordinary feed of a drill, 1 in. in diameter. This represents the angle at which the cutting edge is advancing into the work, which it will be seen is inappreciable as compared with the clearance angle.

The greatest percentage of gain, due to the increased angular twist in this drill, it is emphasized, is found in the improved cutting conditions at the center of the drill next the web, where the angle corresponding to the rake of a lathe or planing machine tool is only a fraction of that at the outside of the drill. This is indicated by the dotted line OF, which in the older type of drill makes an angle with the axis of the drill of only $3\frac{1}{2}$ deg., while in the new drill it is $4\frac{1}{2}$ deg., an increase of approximately 30 per cent. The increased angle of twist increases the amount of metal removed in making the drill, which in turn increases the area for chips. The curved side of the flute is shaped so that it will deflect the chip readily and form it into a spiral, which will preserve its shape, thus enabling the drill to clear itself readily. Where cast iron is being machined, the chips will not coil and free themselves in this way, but the curve of the flute is relied upon to break up the cast-iron chip and thus enable it to be pushed to the top of the hole or easily blown out if an air blast is used.

PURIFYING PRODUCER GAS

The Use of Hydrated Iron Oxide for the Removal of Sulphur

BY A. J. WALLACE*

A recent issue of *The Iron Age* contained an article by C. A. Tupper, dealing with the removal of sulphur from producer gas through the medium of iron oxide. Mr. Tupper's remarks open up an interesting topic for discussion, and the writer wishes to say a few words on the subject.

For a considerable length of time the producers of illuminating gas in America have complied with the law and satisfied their customers by removing the sulphuretted hydrogen contained in their gas, varying from 1 to 10 grains per cubic foot, with hydrated iron oxide, largely prepared from borings and turnings. During the conversion from metallic iron to oxidized iron, considerable heat is developed, requiring careful watching and handling to prevent the production of a partly or practically dehydrated mass. Mr. Tupper mentions dehydrated material, which may prove efficient to a certain degree; but oft repeated experiments have demonstrated beyond doubt that the more completely the purifying oxide is hydrated the better it will answer the purpose for which it is intended, provided that other features of the material are in the right condition. In using the word hydrated, we are referring to water of combination, that is, moisture chemically combined with the oxide and not free moisture which is an entirely different proposition.

Several years ago, one of the largest illuminating gas companies in the United States began looking for material that would permit of a greater rate of flow or an increase in its output, without a corresponding increase in purifying capacity. The search settled on material in a finely divided state, and the company found what it was looking for in an oxide coming from abroad, which is known as precipitated oxide. The material in question, in addition to its high state of hydration is finely divided and in a colloidal state. In this connection, I desire to quote from a report prepared by the Institute of Industrial Research, Washington, D. C.:

It is a well recognized fact that in gas purification the purifying value of iron oxide is dependent upon a high state of hydration and for a given weight of oxide is proportional to the area of reacting surface exposed to the gas. First of all, it is necessary that the oxide be in a hydrated state, as an oxide which has been deprived of its water of hydration, for example an ignited oxide, is practically inert. The superiority of sample L is undoubtedly due to its higher state of hydration and higher percentage of very fine material, which offers a large reacting surface area when distributed over wood shavings or sawdust.

IRON SPONGE FOR PURIFYING STEEL WORKS GAS

Gas purification from the standpoint of the steel trade involves the question, Can the H₂S be removed from producer gas at a low cost? This can be answered in the affirmative without hesitation as the operation is taking place daily at every illuminating gas plant in the country, and those in charge will tell you that sulphur purification is the lowest cost on the list, ranging from 0.001c. to 0.002c. per 1000 cu. ft., depending on the sulphur content, methods employed, etc.

The material is used in the form of iron sponge, representing a mixture of the oxide with shavings, corn cobs, coke breeze or anything of like character.

I would say, however, that shavings are generally employed, due to the ease with which they can be obtained as a rule and their cheapness. Coke breeze, which is usually present around an iron and steel plant, would answer the purpose just as well and there is no reason why it could not be employed successfully. Purifying boxes are built by a number of companies, and are comparatively inexpensive, simply representing containers for the oxide.

Until recent years the usual installation consisted of four cast iron boxes, rectangular in form and varying from 3 to 6 ft. in depth. In some cases they were elevated from the ground to permit of their being emptied quickly through openings in the bottom, and at the minimum expense. Usually, however, they were placed on the ground level, being filled and emptied by removing the covers. The boxes were generally housed in, to protect them from variations in temperature and to keep the operation of handling the oxide under cover. Recent practice has veered toward exposed steel cylindrical purifiers, which can be erected at a much lower cost than the old type of equipment. In some instances, they are elevated to reduce labor charges in emptying, but the preference appears to be for boxes placed on the ground, which are dumped and filled through doors or openings in the sides.

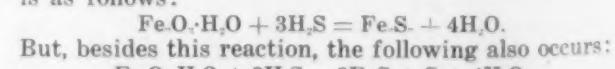
As a matter of precaution, exposed purifiers are often lagged with brick on the outside, sometimes on the inside, to guard against sudden changes in temperature; but this is largely a matter of location. The modern type of purifier is 10 or 12 ft. in depth and carries two and sometimes three layers, as compared with one, or two at the outside, in the older boxes.

THE METHOD OF PURIFYING

The method of operation is exceedingly simple, when efficient purifying material is used. As a practical illustration, we will select a plant making 1,000,000 cu. ft. per day of water gas, containing approximately 100 gr. H₂S per 100 cu. ft., and purifying with four boxes holding 1000 bushels apiece of iron borings oxide. It is claimed that half this quantity of the precipitated oxide would give the same or even better results, due to its unusual absorbing properties and high state of activity, permitting of a shorter reaction between the H₂S and the oxide than is required with iron borings oxide or natural ore.

The gas cooled down to 90 deg. F., plus 1 per cent. of air, which is added in various ways, is passed through the four boxes in turn, and then to the holder. At the termination of a week or ten days, the boxes are rotated; that is, No. 1, called the dirty box, is placed in the position of No. 3 or No. 4, depending on the method followed. If the latter, the position of the boxes after the first rotation would be 2, 3, 4, 1; following this, 3, 4, 1, 2; succeeded by 4, 1, 2, 3, and finally a return to their original position of 1, 2, 3, 4.

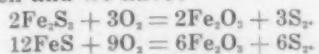
What is happening in the meantime? The greater part of the sulphur is removed in the first box; say, an average of 70 to 80 grains. With ordinary oxide the larger part of that remaining is removed in the second box and the final grains in the third box. The reaction involved in removing the H₂S is as follows:



For some reason the oxide will not take up the oxygen in the gas, in the presence of appreciable amounts of H₂S. This explains why the dirty box is placed last; the H₂S having been removed in the

*E. J. Lavine & Co., Philadelphia.

first three boxes, the oxide is not hampered in taking up the oxygen and we have:



In days gone by, before the use of air and the rotation system, it was necessary to dump or empty the first box, as soon as a stain appeared on the outlet of the second or third box, depending on the method followed. This meant frequent changes and high labor charges. With the rotation system and precipitated oxide, it should be possible to retain the oxide in place until it is completely fouled, depending on the question of back pressure.

If necessary to empty a box before it has reached the limit of its absorbing properties, the material is piled in a heap for a short time to heat up and then spread out in piles, so that air comes in contact with each particle of oxide.

CURRENT PRACTICE

As absorption of 60 per cent., based on the total weight of the fouled mass, is considered to be the limit in efficient management, it may be possible to introduce more sulphur, but as this element increases the material becomes sluggish, and it simmers down to a matter of labor charges versus the additional quantity of gas old oxide will purify.

Mixtures of various strength are prepared. The writer knows of one gas plant using as small a quantity as 12.5 lb. of iron (not oxidized iron) per bushel. I am acquainted with another plant using 25 lb. of iron per bushel. When borings are employed, the usual mixture is 18 to 20 lb. of iron per bushel. This gives a product containing approximately 22 to 24 lb. of oxidized iron per finished struck bushel. Occasionally references are made to a heaping bushel, but as a rule the term bushel, as applied to oxide, represents a struck bushel of 2150.4 cu. in.

Oxidation in a short period is not a simple task, and if too much iron is employed, more or less of it never will become oxidized. By the time the material has been in use long enough to become completely transferred into oxidized iron, there is sufficient tar and oil present to prevent any further oxidation.

The recommended amount of oxide is 22 lb. per bushel, although as high as 35 lb. is employed by some works. The amount that can be employed to the best advantage is governed by the matters of tar and back pressure. If the gas is thoroughly cleaned before it reaches the purifying boxes naturally better results can be obtained with a 30 or 35-lb. mixture than with 22 lb. On the other hand, if the gas contains a small percentage of tar and oil, aside from rapidly reducing the life of the oxide, it leads up to back pressure and it becomes necessary to empty a box whether the material is still capable of removing sulphur or not.

A bushel of sponge containing 22 lb. of precipitated oxide per bushel will purify from 150,000 to 200,000 cu. ft. of water gas (containing 100 grains of H_2S per 100 cu. ft.) and a proportionate quantity of coal gas. The exact quantity purified becomes a matter of purifying facilities, sulphur content of the gas, the percentage of tar and oil present, how the material is handled, and so forth.

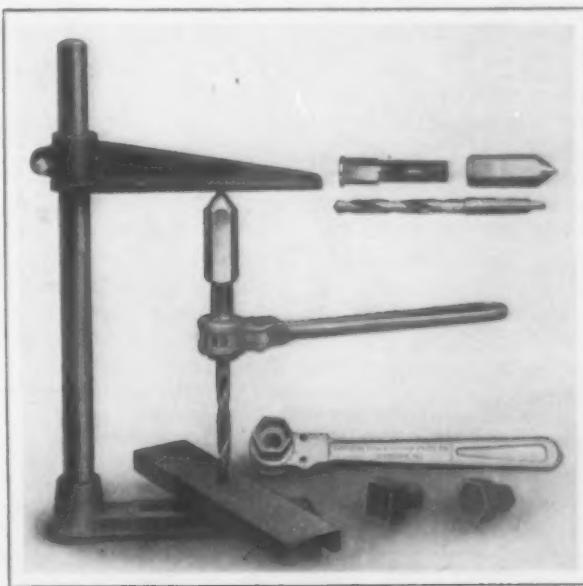
Some plants fill their purifiers, and figuratively, if not literally, shut the doors of their purifier house and proceed to forget the operation. On the other hand, the average gas plant is purifying carefully, and delivering gas entirely free from hydrogen sulphide, with the minimum of trouble and at small expense.

The elimination of this element, while perhaps a new problem, so far as producer gas is concerned,

offers no insurmountable obstacles, and any plant wishing to look into the matter can secure all the information needed to pass judgment on the merits of the case, without trouble or expense, by applying to the proper authorities.

Combination Ratchet Wrench and Drill

The Chicago Mfg. & Distributing Company, 2608 West Twenty-sixth street, Chicago, Ill., has brought out a ratchet wrench with reversible sockets, designed for use on heavy bridge and track work and similar operations and a combination wrench and drill. The special feature of this combination is that the ratchet wrench can be converted into a drill



A Combination Ratchet Wrench and Drill Capable of Handling Round or Square Taper Shank Tools Ranging from $\frac{1}{4}$ to $\frac{9}{32}$ in. in Diameter

for handling round or square taper shank drills ranging from $\frac{1}{4}$ to $\frac{29}{32}$ in. in diameter.

The wrench and drill combination is intended for use in connection with a drill post, as shown in the accompanying illustration. The socket fitting in the wrench is threaded on one end to provide for feeding the drill into the work. In operation the hexagon shell pressing against the underside of the arm of the drill post is held with one hand, while the wrench is operated with the other. This causes the threaded socket to turn and force the drill downward through its 3 in. of travel. The drill post is made with a malleable iron foot and arm and the post proper is of solid steel. The arm is 8 in. long, and can be placed 18 in. above the foot if desired. The weight is 15 lb.

Two sizes of wrench are made for handling nuts ranging from $\frac{1}{4}$ to $1\frac{1}{4}$ in. in size.

A Country-Wide Electrical Prosperity Week

A nation-wide movement to focus attention on the use of electricity for light, for power and for other uses has been launched by the Society for Electrical Development, which has headquarters in the Engineering Societies Building, 29 West Thirty-ninth street, New York City. The celebration is to take the form of an "Electrical Prosperity Week," beginning Monday, November 29, and ending Saturday, December 4, 1915. A committee of the society having the work in charge has asked the society for an appropriation of \$50,000, for printing, advertising and other expenses, and it is estimated that the society will devote sufficient money from its regular appropriations to swell the total to \$100,000. A simultaneous display throughout the country of store window lighting and of special town illumination is planned.

INSPECTING FOUNDRY PRODUCT*

The Broad and Beneficial Service of the Buyer's Representative

It is strange the way in which some manufacturers look upon inspection. A crane manufacturer told me some time ago that he didn't see the need of any inspection on his cranes. He purchased the beams of a certain mill, where they knew how to make beams; his castings came from a certain foundry, where they knew how to make castings; he had been in the business for just so many years, and he knew how to make cranes. This man was using an 8-ton hook that he arbitrarily rated up to 10 tons, and assured the purchaser that it was good for 12 tons. Another manufacturer of hooks rated it at 6 tons. Fortunately the other parts of his crane were not on this free basis.

The inspector has the right to go back of the finished product and to look into the processes of production. To say that it is unjust or unfair to prescribe the manner in which a thing should be made and at the same time to define its qualities is only defensible when the manufacturer can show that the prescribed manner of production is not the best or not a good one to produce those qualities in the product. A good inspector will satisfy himself as to the methods of manufacture as well as the evident qualities in the manufactured article.

SIZE OF CAST-IRON TEST PIECES

In cast iron, test pieces, when required, are cast in sand molds at the same time at which the castings are poured. The inspector, on his part, should see that this is the case, and the manufacturer should allow him facilities for so doing. Formerly a 1-in. square bar about 5 ft. long was used in this test. The advantage of this bar is that it can be tested in cross bending without a special machine, as the load to be hung at the middle point is only about 500 lb. Sometimes a 1-in. bar a little over 1 ft. long is used. This requires a machine, as also does the so-called arbitration bar. The latter is a round bar $1\frac{1}{4}$ in. in diameter and 15 in. long.

Manufacturers should be careful to have test bars cast the exact dimensions called for. Otherwise, an error is apt to be made in converting the results of tests to agree with specifications. It is easy to cast a bar $1\frac{1}{8}$ in. square, when the specifications say that the bar is to be 1 in. square. It might look like giving more than is asked. Or it may be considered by some as of small importance—only $\frac{1}{8}$ in. Again, the significance of this $\frac{1}{8}$ in. may not be understood by the inspector, as not all inspectors are familiar with the theory of flexure. An eighth of an inch increase in the side of a 1-in. bar increases its area 27 per cent.; but it increases the resistance to bending 42 per cent.

Test pieces ought to be cast in duplicate or long enough to make two breaks, so that if a flaw exists in the first break, a second can be made. Cast iron is not weakened by bending tests as tough metals would be, so that the second test, even if it be partly lapping the first, would still be a fair test.

Cast steel test specimens are cast in the shape of a coupon on the casting itself, and after annealing this is cut off and trimmed up for a tensile test. Sometimes also a bending test is required. It is important that the inspector see this coupon before it is cut off the casting and also that the coupon be left on the casting until after the an-

nealing, so that its treatment will be the same as that of the casting.

INDEFINITE SPECIFICATIONS ON STRENGTH

Some trouble is occasioned on account of indefinite specifications for steel castings. Often a lower limit is given for the ultimate strength, but no upper limit is mentioned. At other times it is merely stated that the steel shall be of an ultimate strength, of say 70,000 lb. per sq. in., and manufacturers are apt to take the stand that this is meant to be the average ultimate and to assume an allowed variation of 5000 lb. per sq. in. each way. It would be well if manufacturers would ascertain from purchasers just what is wanted.

In the matter of the dimensions of iron and steel castings, the inspector is apt to meet with many variations from the ideal and correct, some of which are serious, and some are not. The most serious faults in dimensions arise from bends, warps, twists, etc., as these are generally accompanied by damaging internal strains and are due to improper treatment. Sometimes steel castings will show almost unavoidable warps or curves due to unequal cooling. The discovery of these irregularities by the inspector may lead to a means of avoiding or remedying them in later work. By weighting steel castings in the annealing furnace warps or twists may possibly be corrected. It is perhaps better to make the pattern thicker and trim off the extra metal.

Cored holes where drilled holes are called for give rise to a provoking situation. It does not meet the case to ream or drill the holes that are already cored, for they cannot then be accurately located, and the holes will not be true. Castings that are to be planed and in which too scant allowance has been made in the pattern give the inspector cause for worry. Drilled holes and the planing off of the surface of a casting give the inspector an opportunity to detect porosity or sponginess in castings that he would not otherwise discover.

Out and out rejection of what the manufacturer considers trivial leads to friction between manufacturer and inspector. An inspector is expected to exercise discretion, and the inspector who adheres too rigidly to the letter of the specifications may be doing the manufacturer an injustice. On the other hand, the manufacturer who attempts to bullyrag an inspector into accepting something questionable on the plea that he is too rigid is very frequently the one whose work will not stand much inspection. For the production of best results the inspector and the manufacturer work together. It is not always the best sign when they play together.

SURFACE INDICATIONS OF STEEL CASTINGS

Whenever there is surface indication of unsoundness in steel castings, they should be regarded with the greatest suspicion. Recently an inspector objected to a steel casting of a pinion because of a small hole which he suspected was but the opening to a cavity inside. The maker of the casting pooh-poohed the idea and produced a nail with which he probed the hole and found that it did not appear to be deep. The inspector called for a bucket of water and proceeded to ascertain the size of the cavity by filling it with water. A good sized bucket of water was required to fill the hole. The effect of a cavity of this sort at the root of gear teeth can readily be understood.

When the sink-head is cut off, and there is found to be sponginess where it joins the main casting, it is an indication that its size was not great enough for the purpose. Some recommend 30 to 50 per

*From a paper read on Monday, April 19, by Edward Godfrey, of R. W. Hunt & Co., inspection engineers, Pittsburgh, before the Pittsburgh Foundrymen's Association.

cent. of the actual casting in the sink-head. Gates should be large so as to hold the heat and not choke up by cooling, and so as to allow upward passage of bubbles.

Seams and folds and shrinkage cracks are sometimes mended by autogenous welding. This should be done only with the inspector's permission and after he has seen the defect. Also, he should be allowed to see the work after chipping to the base of the fault, preparatory to the welding.

Sometimes cracks that have been welded by oxy-acetylene or electric process break open again beside their original location. This, of course, is due to shrinkage of the metal after it has been heated. I believe that peening of the added metal while it is cooling would largely, if not entirely, relieve these shrinkage strains and result in a much stronger weld.

A MILL FOR COLD ROLLING STEEL

Plant of the Schwartz-Herrmann Steel Works for Rolling Band Steel

A mill for cold rolling band steel down to a fineness of 0.001 in. thick was erected some months ago by the Schwartz-Herrmann Steel Works, at Floral Park, Somerville, N. J. The plant consists of three connecting one-story buildings, about 150 x 355 ft. over all. The rolling mill consists of two batteries of German rolls, one of four 8-in. rolls, and one of six 6-in. rolls, each belt driven from shafting by a 50-hp. motor. The rolls are operated by herringbone gear drive, equipped with a shackle bar between the driving gears and the rolls to absorb chatter and vibration. The rolling mill also contains a machine shop, and space is provided for the future installation of special heat-treating furnaces and milling machinery for the manufacture of hot roll bar of irregular cross-section. The company contemplates also the manufacture of roll shells.

The annealing and rod room is approximately 100 x 135 ft., and contains a gas producer of the R. D. Wood type and a gas-heated annealing furnace. The pickling room is 20 x 100 ft., and is equipped with standard pickling vats. Ventilation is provided by a monitor roof running the entire length of the room, with fixed louvers along its two sides. The company specializes in thin, band steel, principally for stamping purposes, and has a capacity of about 300 tons a month, rolled to particu-

lar specification as to chemical composition, hardness, etc. Work is usually done on steel from soft basic to 1.30 per cent. carbon steel.

The rolling mill is under the management of Karl A. Herrmann, formerly with the Crucible Steel Company of America at Jersey City, N. J. The superintendent at the plant is George Winters, who was for 10 years with R. H. Wolff & Co. of Harlem, New York, and 15 years with the Crucible Steel Company of America. The company credits a great deal of its ability to turn out steel to exact specifications through the experience in steel mill operation which these officials have had.

In rolling the steel, test pieces are put through the rolls and the reduction is increased until the safe limit of elasticity is exceeded and the steel cracks. This cracking is always the first operation at the rolls and it is a rule of the company to test each steel in this manner so that cracking can be avoided in the actual reduction and so that in this way any flaws from working the material may be avoided. The loss in time and material is considered slight by the management.

Increasing Demand for Large Crushers

The Power & Mining Machinery Company, 115 Broadway, New York, has built a 60 x 84-in. receiving opening jaw crusher for the Bethlehem Steel Corporation's Chile iron mines, sectionalized to a 30,000-lb limit to facilitate handling at destination. The total weight is 525,500 lb. The service in this instance is particularly severe, as the compressive strength of Tofo iron ore is close to 44,000 lb. per square inch, compared with hard trap rock of the United States variously estimated at 35,000 to 40,000 lb. Immediately following this initial breaker, and taking the 10-in. product from it, there will be installed three No. 9 McCully all-steel gyratory breakers.

The same company has recently shipped a 66 x 84-in. receiving opening jaw crusher to a company on the Pacific coast and is putting through its shops another of the same size which will also be shipped to the far West. The construction is all steel, the pitman being spring supported to relieve the bearings of its weight; the bearings are steel bushed, lined with babbitt, automatically lubricated and water cooled. It is stated that the first 60 x 84-in. machine of this type, built for the Birdsboro Stone Company, Birdsboro, Pa., and installed five years ago, demonstrated these and other features to be so successful that they have been embodied in all subsequent machines. Approximately 2,000,000 tons of trap rock has been put through this crusher with no expense for repairs other than renewal of the lower tier of crushing plates.



Two Groups of German Made Rolls, Four 8-In. and Six 6-In. Strip Steel Is Reduced to 0.001 In. in Thickness by Alternately Passing It Through the Rolls and Annealing It in a Gas-Heated Furnace.

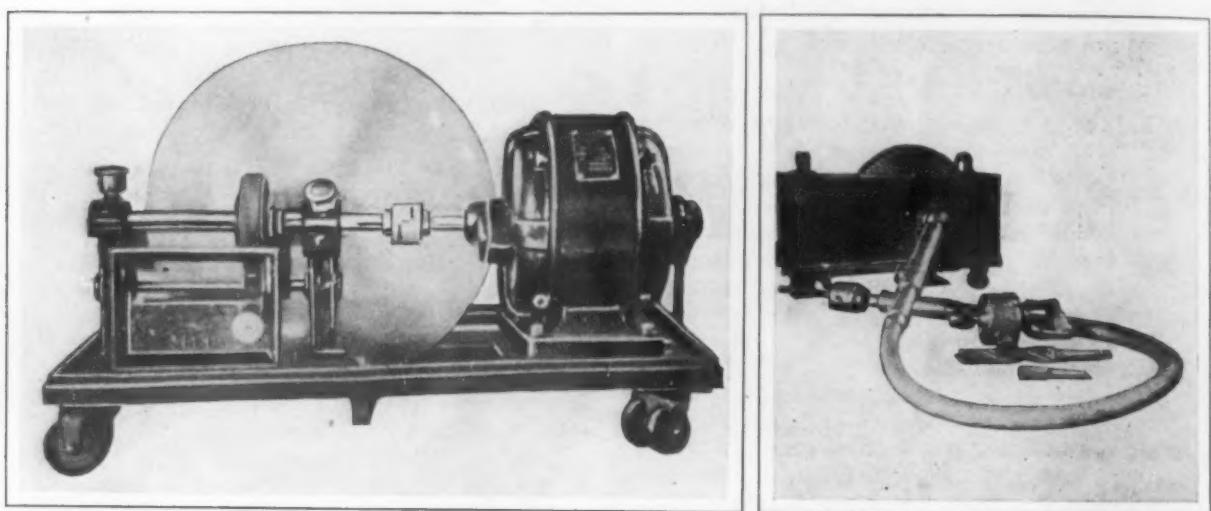
Portable Drilling and Grinding Machine

To provide machine shops, foundries, manufacturing plants and garages with a portable drilling and grinding machine, capable of doing heavy work and work in places where it would ordinarily be impossible, the United Mfg. Company, Kansas City, Mo., has brought out the combination shown in the illustrations. The outfit consists of a revolving bit socket mounted on the end of a flexible shaft which is driven by a Westinghouse electric motor through an adjustable-speed friction disk device. It is built in sizes ranging from $\frac{1}{4}$ hp. to 1 hp., and the largest size will accommodate drills up to a maximum diameter of $1\frac{1}{2}$ in. The flexible shafts range from 5 to 10 ft. in length.

The motor, which can be employed on either direct or alternating current circuits and the friction drive are mounted on an iron base to which swivel casters are fitted, and the unit is inclosed

Electromagnetic Nail Packing Machine

A machine for arranging nails in parallel rows, preparatory to packing them in boxes or cartons, has been developed by Otto Gamper, Zurich, Switzerland, and is being marketed in the United States by Albert T. Otto & Sons, 1876 Broadway, New York City. It operates on the principle that all linear iron objects as soon as they are brought into a homogeneous magnetic field must adjust themselves automatically under the influence of the magnetizing current in the direction of the magnetic lines of force which always run parallel to each other. While the machine is designed for packing nails, it can also be used for other linear objects, such as wire rods, coach screws, hairpins, pens, knife blades, fish hooks, etc. The packages to be filled by this machine may be the standard type of nail keg, wooden boxes or paper cartons. Where kegs are packed by dumping or throwing the



A Portable Power Plant for Use in Machine Shops and Foundries Where Heavy Drilling and Grinding Work Has to be Done

in a metal case fitted with handles to facilitate carrying.

Adjustments are provided to take up wear on the driving disk and to vary the contact between the disk for various classes of service. A lever provides six speeds at the tool which can be stopped without shutting off the current from the motor. By using attachments it is possible to secure 18 speeds, ranging from 165 to 3200 r.p.m., for grinding, drilling and polishing.

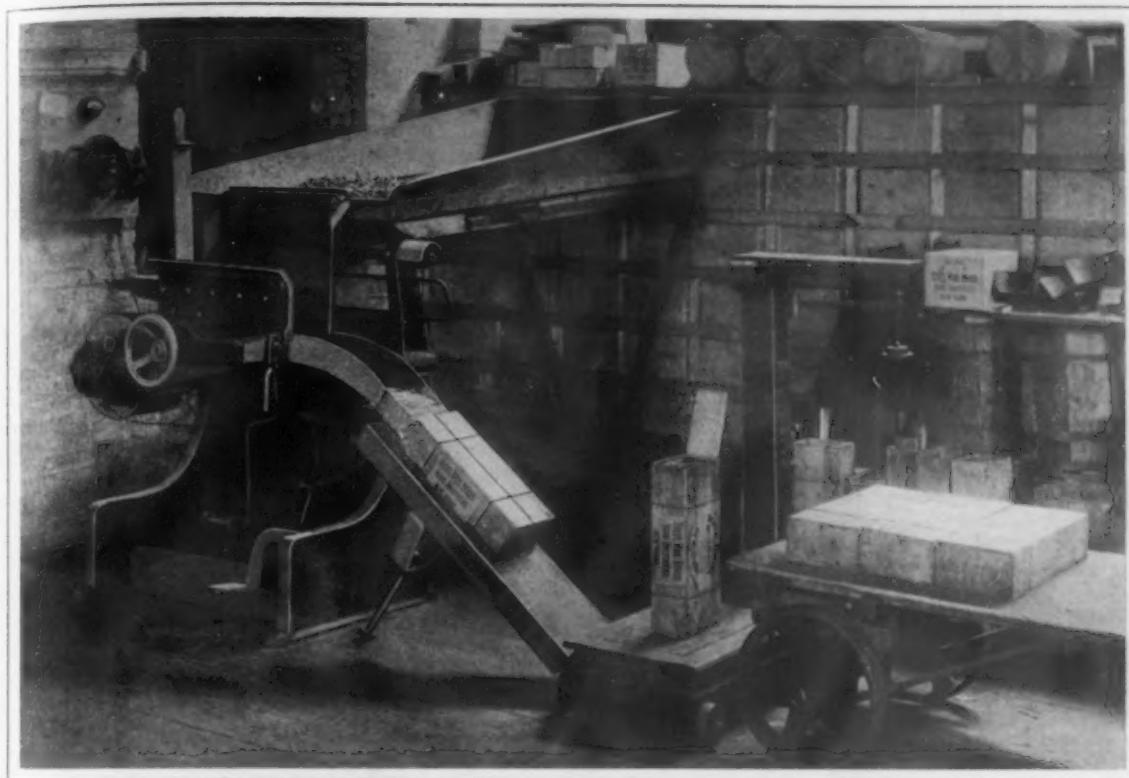
A Large Limestone Development

The Carbon Limestone Company, Youngstown, Ohio, has recently expended about \$125,000 on its properties at Hillsville, Pa., putting in large crushers, steam shovels, etc., so as to do all the work mechanically. The product is now handled altogether without hand loading. The magnitude of the company's operations may be inferred from the fact that, including contracts with furnace companies for limestone for flux, the output now approximates 1,000,000 tons a year. It owns in fee in its quarries about 30,000,000 tons of limestone and has under lease 600 acres of additional limestone territory. It has five miles of its own railroad tracks.

A plant has just been installed for the crushing of limestone to a degree of fineness suitable for agricultural purposes. In this field of its activity, the company is not only doing a large business at present but expects to expand greatly in the near future, with the increasing knowledge by farmers of the high value of crushed raw limestone for the improvement of land. It issues an illustrated booklet on this subject. Robert Bentley is president.

nails in, it is necessary to place the last third by hand to be able to put the top in place. With the Gamper machine this is not necessary, it is pointed out, as the nails are arranged in even rows, and the waste space is eliminated, with the result that a smaller keg can be used, thus saving material for the kegs, labor for handling and freight charges. Where pasteboard 10-lb. cartons are used, it is estimated that the saving in freight is 4 per cent. due to the decrease in the weight of the container.

The machine consists of two parts, the paralleling mechanism and the feed trough above which is fitted with a shaking device. The objects to be packed are emptied into the feed trough in lots of approximately 1000 lb., and by the action of the shaking device are brought to the front of the trough, where they drop into the paralleling mechanism. This consists of a tray, each side of which forms one pole of the electromagnet. These objects, while falling, are drawn into the direction of the magnetic lines of force, and it is pointed out, are formed in mathematically parallel lines. They are thus arranged in parallel and are held suspended in the paralleling mechanism by the lines of force. However, considerable space surrounds each nail and to reduce this and bring the nails into close contact with each other, the vertical lever at the left of the engraving is swung down into the space between the two poles of the magnet. This movement cuts off the magnetizing current and compresses the nails. The tray forming the bottom of the paralleling mechanism then swings down-



A Machine for Packing Nails in Which They Are Brought into Parallelism by the Influence of an Electromagnet

ward to empty the nails into the pasteboard carton or wooden box as the case may be.

The machine is driven by a $\frac{1}{2}$ -hp. motor mounted on the back of the machine, and this drives the shaft shown at the right of the feeding trough. A cam on this shaft operates the shaking device mentioned. The amount of current required for the magnet is approximately $\frac{1}{2}$ kw-hr. per day. For changing the machine to accommodate various sizes of nails, all that is necessary is to shift the front magnet pole and insert a packing tray corresponding to the length of nail to be handled.

One of the fields for which the machine is particularly adapted is the packing of foundry nails. In a test made it was found that while only four kegs could be packed per hour by hand, it was possible to pack 20 by machine. The output on 6-in. nails is estimated at from 40 to 60 kegs per hr.

Domestic and Foreign Barb Wire

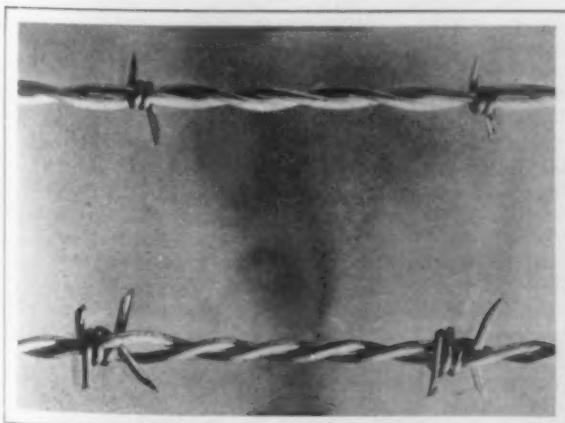
The difference in barb wire for the domestic trade and that for export to the countries at war, many thousands of tons of which have been sent

abroad, is shown in the accompanying illustration. The upper picture shows the common form of two-point barb wire, used almost exclusively in the Central Western States. The barbs are about 3-in. apart and are about $1\frac{1}{2}$ in. long, with short points. The lower picture shows the wire used by the warring countries. There are four barbs about 1-in. long, and the points are more than twice as long as in the domestic wire. In some cases the wire is made with the barbs spaced 6 in. apart, but in most of it the barbs are only 3 in. apart. Practically all the large makers of barb wire in this country have shipped thousands of tons of this wire abroad, and much of it is still being sent.

Work in Industrial Hygiene at New York

To systematize and develop the work of the Department of Health of the City of New York in occupational diseases and the sanitation of workshops and other places of employment, a new division with the title of the Division of Industrial Hygiene has been formed. The commissioner of health has addressed associations of the manufacturers and merchants, inviting them to name representatives to confer with the division, with a view to promoting proper sanitary standards in industrial establishments. The work planned includes a general industrial survey, comprising a statement of the number of employees in the city in extra-hazardous occupations and a general statement as to where the most unhygienic plants in these industries are situated, an intensive study of the conditions of work and the physical condition of the workers in half a dozen of the most hazardous industries and the making of arrangements with certain dispensaries to open special occupational disease clinics to which all sufferers from occupational ills could be referred. Dr. Louis I. Harris is the chief of the new division, which is located in the Municipal Building, New York City.

The C. W. Hunt Company, Inc., manufacturer of coal handling and conveying machinery and small motor trucks, has moved its New York office from 45 Broadway to the eleventh floor of the new building of the Adams Express Company, 61 Broadway.



The Common Two-Point Domestic Barb Wire Is Shown in the Upper Specimen and the Four-Point Wire Shipped to the Warring Nations Is Shown in the Lower Specimen

STEEL CORPORATION PENSIONS

Chairman Gary Explains Why Changes Were Made in the System

Statements have been published in the past week, from an address at Pittsburgh by Monell Sayre, secretary of the Episcopal Church Pension Fund, to the effect that the United States Steel Corporation had altered its pension fund regulations recently and to the detriment of its employees. Replying to this criticism Chairman E. H. Gary, of the Steel Corporation, has written the following:

The United States Steel and Carnegie Pension Fund began operations on January 1, 1911, through the joint action of the United States Steel Corporation and Andrew Carnegie. The Steel Corporation undertook to provide a fund of \$8,000,000 to be used jointly with the Carnegie Relief Fund of \$4,000,000 created by Mr. Carnegie on March 12, 1901, making an aggregate fund of \$12,000,000 from which the income was made available for the payment of old age pensions to superannuated employees.

At the time when it became possible to institute this pension system the United States Steel Corporation had not available the large mass of data regarding the ages and length of service of its more than 200,000 employees which has since been collected. We might have waited several years for the accumulation and study of such data as it was possible to obtain; but even then the result would have been incomplete. Over 2000 employees have been pensioned during the four years in which our pension fund has been in operation who would have had no pensions had we delayed the institution of our pension system. For these reasons it seemed fairest and best to start our pension fund upon as generous a basis as appeared possible and adjust it from time to time to our experience under it.

RETIREMENT AGE MADE 65 YEARS

In the four years of our actual experience, we have found that the average age of retirement (including cases of permanent total disability for which special provision is made) has been 65.56 years, and the average length of service 30 years. As originally instituted, our plan permitted retirement at 60 years after a service of 20 years. In view of these facts, it seemed entirely fair to modify our pension rules to conform to this experience. We therefore established 65 years as the age of retirement and increased the required length of service to 25 years. This is less than is required by many, if not most, of the pension systems in this country.

This explains two of the only three changes made in the rules. The third change was a modification of the rules to encourage employees to remain steadily in the service. . . . In the four years during which our pension fund has been in operation we believe that our employees have learned the disadvantages of leaving the service except for good reason; and we think the time has come to discourage such action, resulting nearly always to the disadvantage of the employees themselves. Therefore, we have modified our pension rules in this respect, still leaving the employees ample protection against any loss of their service credits through unavoidable absences. They may be absent for six months on account of leave of absence or suspension, for a year on account of lay-off due to reduction in force, or for two years on account of illness or injuries, without any loss of credit for previous service. We believe this to be ample protection for employees who have any good cause for absence, and think that under the present conditions any different provisions with respect to absences would be demoralizing to the men.

PENSION SYSTEM ON A SOUND BASIS

These are the only changes which have been made in the United States Steel and Carnegie Pension Fund. Our efforts and the plans upon which we are now at work are to put our pension system upon a better

basis and to give greater protection both to the men who have already been granted pensions and to those whose service will entitle them to apply for pensions in the future. Few of the private pension systems established for employees of railroads or industrial organizations have any fund held in trust for pension purposes. Our system has such a fund and it is our desire to continue to add to that fund. In most of such systems the pension payments of each year are merely made out of earnings like any operating charge. Such is even the case with respect to most of the pensions from the city of New York to the superannuated employees of its various departments. It is our endeavor to put our pension system, which is based upon the joint fund made available by the action of Mr. Carnegie and the corporation, upon an exceptionally sound basis, insuring the fullest protection to all. The system is in a better position than that in which it began operations, and we hope to continue to improve it.

China's Iron and Steel Works in 1914

K. T. Chiang, secretary of the Hanyang Iron Works, Hanyang, China, stated at the recent 23rd anniversary dinner of the company that operations the past year had proceeded smoothly with the exception of the destruction by a sudden flood of an important bridge, causing a shortage of 30,000 tons in the coal supply. A shortage of coke had resulted in a reduced output of more than 1000 tons from No. 1 and No. 3 blast furnaces. The 1914 production of pig iron was estimated at 135,000 tons and the steel plant was credited with 98,536 tons. A new blast furnace, the fourth, was completed in the year, as well as a new steel furnace, No. 7. The plate mill, the rail mill and the firebrick plant were being extended. The ore taken from the company's mines at Tayeh was 480,000 tons in 1914 and other deposits were purchased. The output for this year is expected to be nearly 700,000 tons. A new blast furnace will be built at Yuan-Chiahu, west of Shi-hui-yao, on a recently purchased piece of land. This is not far from the iron mines at Tayeh. The mining of coal at the company's collieries at Pinghsiang is progressing, with an output of 560,000 tons a year; the sinking of a new shaft will increase the annual production to 640,000 tons. The coking plant made 165,000 tons. The Chinese Ministry of Agriculture and Commerce is reported to have recently sent a representative to inspect the properties of the company, to form an estimate of its value with a view to converting it into a state undertaking.

Pacific Coast Metal Trades Convention

The ninth annual convention of the United Metal Trades Association of the Pacific Coast was held at Portland, Ore., April 17. In attendance were about 50 delegates from Vancouver, British Columbia and from Everett, Seattle, Tacoma and Spokane, Wash., as well as from Portland. The subjects given most discussion were accident prevention, industrial education and workmen's compensation and other legislation. It was decided to issue a safety first bulletin to be distributed among the employees of members of the association, also to appoint safety committees in each shop. The responsibility of manufacturers for getting better men in office was emphasized, and the members were urged to exert themselves for the passage of better laws. Cooperation with trade schools in teaching boys trades was urged. The social features of the association were found to have produced good results and they will be continued. The following officers were elected: President, J. M. Fitzpatrick, Union Iron Works, Spokane; first vice-president, Eugene Roberts, Puget Sound Iron & Steel Works, Tacoma; second vice-president, A. M. Clark, Columbia Steel Company, Portland; third vice-president, E. Johnson, Seattle Machine Works, Seattle; treasurer, W. F. Prier, Oregon Brass Works, Portland.

The C. F. Burgess Laboratories is the new name of the Northern Chemical Engineering Laboratories, Madison, Wis. C. F. Burgess, formerly professor in the University of Wisconsin, is still president, no change in management or ownership having taken place.

Customs Decisions

METAL WINDOW SASHES

Sustaining protests by J. J. Gavin & Co., New York, the board has decided that the general metal provision of the present tariff law is not applicable to complete steel window sashes with steel sides, fitted with gun metal stays and gun metal handles or hinges all fastened together. The board holds that importers are entitled to enter the merchandise at 10 per cent. under paragraph 104, as "steel sashes." The collector's action in returning the sashes at 20 per cent. under paragraph 167, as manufactures of metal, was reversed.

SHEET STEEL FOR GIN SAWS

The Board of United States General Appraisers has made an interesting interpretation of the tariff act of 1913 affecting sheet steel made by the open-hearth process. The merchandise in controversy was imported by Wheelock, Lovejoy & Co., at New Orleans to be used for gin saws, and was manufactured by Thomas Firth & Sons, Ltd., Sheffield, England. Duty was levied by the collector as sheet steel made by the crucible process, at 15 per cent. under paragraph 110, while the importers claimed a rate of only 8 per cent. under the same paragraph as having been made by the open-hearth process.

At the trial of the issue, a deposition was read from Frederick Best, secretary of the English manufacturing company, stating that the steel was made by the Siemens open-hearth acid process, and described the process in detail. The board, in finding in favor of the importers, held that steel of the kind in controversy, even though containing large percentages of manganese and silicon, added in the course of manufacture, is properly dutiable at the lower rate claimed under the specific provision for steel made by the open-hearth process. It was held further that manganese and silicon added in quantities absolutely essential to the production of Bessemer and open-hearth steels cannot be considered alloys within the meaning of paragraph 110 without rendering nugatory and incapable of application the entire provision contained in that section for such steels.

ENGRAVING MACHINES NOT MACHINE TOOLS

Several firms in Providence, R. I., protested the collector's classification of engraving machines and engine-turning machines imported under the tariff act of 1909. They were returned for duty at 45 per cent. under paragraph 199 as metal manufactures not specially provided for. The importers claimed a rate of 30 per cent. under paragraph 197 as machine tools. There was nothing in the record before the board to show that any of the machines under consideration is designed to work upon metal. Judge Fischer, in his decision, said that, in addition to being operated by other than hand power, a machine tool must work upon metal and employ a cutting tool. The lack of proof on these essential points impelled the board to overrule the claims. The protestants included the T. W. Foster & Brother Company, Ernst Millmather, and the Watson Company.

CHAIN-MAKING MACHINES

Massee & Co., New York, were sustained in the contention that machines for making chains imported under the act of 1913 are properly dutiable at 15 per cent. under the provision for machine tools. The proof was that the machines in question use a cutting tool and come up to the requirements demanded by the board for such entry. The custom house authorities were reversed in their levy of 20 per cent. under paragraph 167 as manufactures of metal.

STEEL FUSES FOR CANNON

The Bethlehem Steel Company has been sustained by the board in its claim as to the classification under the act of 1909 of steel fuses, about 6 in. in length and 2 in. in diameter, pointed at one end and having the shape of an ammunition shell. In use, they are filled with a high explosive and are inserted in cannon shells to explode them. The collector at Philadelphia classified the articles as manufactures of metal and took duty at the rate of 45 per cent. The importing com-

pany made the claim that free entry should be granted them as safety fuses.

AGRICULTURAL IMPLEMENTS FREE

Gallagher & Ascher, Chicago, were sustained in claims for free entry under the present tariff, as agricultural implements, of scythes, sickles and scythe handles. The Government's assessment at 20 per cent. under the metal provision of the law was reversed.

PARTS OF MACHINE TOOLS

All parts of machine tools except such as are clearly duplicate, extra or spare parts are properly dutiable at the rate fixed in the tariff for machine tools and not at the higher rate provided for manufactures of metal, according to a decision rendered by the United States Court of Customs Appeals in the case of the Norma Company of America vs. the United States. While this case was brought under the tariff act of August 5, 1909, the principle extends to the existing law of October 3, 1913. The articles in controversy were metal-working machines which, together with certain auxiliaries and similar spare parts, were assessed for duty as manufactures of metal at 45 per cent. ad valorem.

STRIPS OF ALUMINUM IN COILS

Strips of aluminum, measuring from 2 to 7 in. in width and of varying lengths, rolled up into coils, are held by the Court of Customs Appeals to be dutiable as manufactures of aluminum at 45 per cent. ad valorem under paragraph 199 of the act of 1909, and not as aluminum in sheets at 11 cents per pound under paragraph 172. The merchandise in this case was imported by Arthur Seligman and the Rome Mfg. Company and was classified by the collector as a manufacture of aluminum.

IRON SHOT, SAND OR GRIT

The United States Customs Court holds that iron shot, iron sand or iron grit imported under the tariff act of 1909 by the Harrison Supply Company are properly dutiable at 45 per cent. ad valorem under paragraph 199 as "unenumerated manufactured articles," composed wholly or in part of metal, and not at the rate of 1 cent per pound as "grit, shot or sand made of iron or steel, that can be used only as abrasives," as provided for in paragraph 133.

STEEL WIRE CABLE

Steel wire cable, heretofore admitted at the leading ports of entry at 15 per cent. as a manufacture of wire under paragraph 114 of the Underwood tariff act, will hereafter pay 30 per cent. as wire rope under the same paragraph. This decision has been promulgated by the Treasury Department and will probably be made the subject of a test case based on the protests of a number of importers. The attention of the Treasury Department was recently drawn to this matter by the auditor, who pointed out that collectors at the leading ports were passing steel wire cable as a manufacture of wire, notwithstanding the higher rate specifically levied upon wire rope. The ruling of the Department is set forth in a letter to the collector of customs at Ogdensburg, N. Y.

At the April meeting of the Purchasing Agents' Association of New York held at the Hotel Breslin, April 20, George Schuhmann, vice-president and general manager of the Reading Iron Company, was the principal speaker. He discussed the relative merits of wrought-iron and steel pipe, basing his arguments for the former on its greater resistance to corrosion. This matter is treated in some detail in an article by Mr. Schuhmann which appeared in *The Iron Age* of November 20, 1913. George F. Barber of the Emerson Institute of Efficiency spoke on "Personal Efficiency." About 50 members of the association attended the dinner.

The E. & G. Brooke Iron Company, Birdsboro, Pa., is preparing one of its furnaces, both of which have been idle since February, 1914, for blowing in May. Operations will be resumed also at the company's iron mine at St. Peter's, Chester County, Pa.

FEBRUARY FOREIGN IRON TRADE

Marked Decline in Tonnage Imports from January and 1914—Tonnage Exports Increase

While the report of the Bureau of Foreign and Domestic Commerce for the month of February, 1915, shows that the value of the exports of iron and steel declined from \$18,053,421 in January to \$16,470,751 in February, this decrease is due to the difference in the number of days in the two months. If these values are divided by 31 and 28 respectively to get the daily average value of the exports of iron and steel and manufactures thereof for the two months under consideration, it will be found that the situation is reversed. The daily average value of exports was \$582,368 in January and \$588,241 in February. The total value of these exports was \$16,520,260 in February, 1914, and \$14,939,614 in December of the same year. The imports of these commodities showed a falling off from \$2,200,687 in January, 1914, to \$1,510,678 in December of last year, \$1,616,593 in January, 1915, and \$1,463,522 in February. In the case of the imports for January and February, the daily average value is practically the same. The value of these exports for the eight months ended with February was \$121,306,489, as compared with \$171,627,968 for the corresponding period of 1914. The import figures were \$15,715,152 and \$20,346,126.

Imports for which quantities are given amounted to 7505 gross tons in February, against 10,569 tons in January, 9046 tons in December, 1914, 24,165 tons in November and 14,711 tons in February. Ferrosilicon, scrap, structural iron and steel and steel billets without alloys were the only exceptions to the general decline, the first named being the most prominent. The greatest decrease was in tin and terne plates, which dropped from 3274 tons in February, 1914, to 266 in February of the present year. The average value per gross ton of the iron and steel and manufactures thereof imported in February, 1915, was \$51.93, as compared with \$51.62 in January, 1915, and \$59.93 in February, 1914.

Details of the imports of tonnage commodities in February and the eight months ended with February, as compared with the corresponding periods of the previous fiscal year, are as follows:

Imports of Iron and Steel

	February		Eight months	
	1915,	1914,	1915,	1914,
	Gross	Gross	Gross	Gross
Pig iron (including ferrosilicon)	555	91	4,360	7,390
Ferrosilicon	555	91	4,360	7,390
All other pig iron	1,132	3,780	77,506	142,320
Scrap	2,050	1,342	23,456	21,111
Bar iron	1,734	2,013	9,882	17,269
Structural iron and steel	240	153	5,177	6,413
Ingots, blooms and steel billets	17	15	885	2,189
Steel billets without alloys	618	2,352	19,569	12,532
All other steel billets	419	1,088	15,261	9,785
Steel rails	151	189	2,156	1,501
Sheets and plates	266	3,274	4,555	16,055
Tin and terne plates	323	414	2,705	8,338
Totals	7,505	14,711	165,512	184,112

*Figures cover period July 1, 1913, to Oct. 3, 1913, inclusive.

†Figures cover period beginning Oct. 4, 1913.

The tonnage of exports for which quantities are given increased approximately 3½ per cent. over January, which in turn showed an increase of almost 20 per cent. as compared with December, and 19.2 per cent. over February, 1914. The totals are February, 1914, 121,203 gross tons; December, 116,816 tons; January, 1915, 139,789 tons, and February, 144,553 tons. These exports for the most part show gains, the more prominent being pig iron, wire rods, steel bars, billets, hoops and bands and wire nails. Barb wire exports were only approximately 21 per cent. greater in February, while in January they were about 62 per cent. more than in the same month of 1914. As was the case in the preceding month, scrap, structural shapes and pipes and fittings declined, while radiators increased from 152 tons in February, 1914, to 173 tons in 1915. This is in direct contrast to the conditions

that prevailed in January when the exports of this commodity were only 128 tons, as compared with 554 tons in the same month of the previous year. The total value of iron and steel exports for which tonnages are given was \$5,038,841 in February, 1915, against \$4,967,336 in February, 1914, the average value per gross ton being \$34.86 in February, 1915, as compared with \$39.44 in January, 1915, and \$40.98 in February, 1914.

Details of the exports of these tonnage commodities in February and the eight months ended with February, compared with the same periods of the previous fiscal year, are as follows:

Exports of Iron and Steel

	February		Eight months	
	1915,	1914,	1915,	1914,
	Gross	Gross	Gross	Gross
Pig iron	14,178	9,456	66,453	153,293
Scrap	3,017	5,221	13,627	56,812
Bar iron	658	187	4,067	8,651
Wire rods	10,864	3,133	43,369	22,015
Steel bars	20,225	8,776	101,585	107,372
Billets, ingots and blooms, n.e.s.	15,697	2,850	55,295	25,696
Bolts and nuts	1,090	1,113	8,332	13,834
Hoops and bands	1,161	462	7,207	8,055
Horseshoes	326	114	6,029	819
Cut nails	193	371	1,359	2,604
Railroad spikes	547	396	3,701	5,420
Wire nails	3,989	2,533	30,032	25,476
All other nails, including tacks	435	171	2,421	2,167
Pipes and pipe fittings	....	17,259	....	170,191
Cast pipes and pipe fittings	2,180	....	44,405	....
Wrought pipes and pipe fittings	3,877	....	67,499	....
Radiators and cast-iron house heating boilers	173	152	2,037	4,333
Steel rails	9,124	10,936	82,983	257,485
Galvanized-iron sheets and plates	3,689	2,596	25,827	37,111
All other iron sheets and plates	921	1,143	4,611	8,472
Steel plates	8,336	12,734	64,769	116,407
Steel sheets	6,985	10,080	63,097	90,835
Structural iron and steel	12,733	17,299	102,033	225,263
Tin and terne plates	5,835	3,395	45,849	26,474
Barbed wire	5,786	4,790	73,431	54,637
All other wire	12,624	6,036	68,929	54,410
Totals	144,553	121,203	988,947	1,477,832

Imports of iron ore in February amounted to 78,773 tons, against 75,286 tons in January, 51,053 tons in December and 381,141 tons in February, 1914. For the eight months ended with February 796,382 tons was imported, as compared with 1,672,995 tons in the corresponding period of the last fiscal year.

Consumption and Imports of High Grade Ferrosilicon

The total consumption of high percentage ferrosilicon, principally the 50 per cent. grade, in the United States is estimated at 13,000 to 15,000 tons annually. A little over 50 per cent. of this is produced by domestic electrolytic manufacturers, the remainder being imported from Canada and Europe. According to data obtained from the United States Bureau of Foreign and Domestic Commerce, the total imports of high grade ferrosilicon, by countries of origin, for the second half of 1913 and the calendar year 1914 was as follows, in gross tons:

	1913, last half, tons	1914, tons	1914, value
Austria-Hungary	24	24	\$1,037
France	10	40	3,794
Germany	..	64	3,004
Italy	50	50	2,731
Norway	70	225	10,519
Sweden	687	1,714	82,371
England	48	48	3,070
Canada	2,407	3,981	235,403
Total	3,296	6,146	\$341,929

Estimates place the annual consumption by the United States Steel Corporation at 6000 to 8000 tons.

The city of Cleveland will receive bids April 30 for riveted steel pipe for the Division avenue pumping station.

Southern Supply and Machinery Dealers' Association

The fifteenth annual convention of the Southern Supply and Machinery Dealers' Association was held April 14 to 16 at Atlanta, Ga. The programme provided for two business meetings each day with numerous social events interspersed during the stay of the members of the association. At the final session the following officers were elected: President, J. G. Belding, Lombard Iron Works & Supply Company, Augusta, Ga.; first vice-president, Ernest Howell, Capital City Supply Company, Charleston, W. Va.; second vice-president, George H. Manning, Knoxville, Tenn.; secretary and treasurer, Alvin M. Smith, Smith-Courtney Company, Richmond, Va. James A. Harvin, Peden Iron & Steel Company, Houston, Texas, the retiring president, and Walter M. MacDonald, Atlanta, will select the next place of meeting. It is understood that Memphis is favored.

Over 500 members were present. There was evident a strong note of optimism, with confidence in the return of normal business conditions over the South. At the opening session the annual report of the organization was read by Secretary Alvin M. Smith. It contained a strong recommendation that the association call on the Interstate Commerce Commission to remedy the injustice now done by the railroads refusing to sell one form of mileage through to points south. Another paragraph announced the intention of the association to continue its work for national one-cent letter postage. Of Southern business conditions, particularly with relation to the cotton situation and the prospects for a return to normal business conditions, the report said:

The lesson of diversified crops has been learned and our planters will most assuredly in the future not confine their attention to cotton alone. This will not only redound to their benefit, but to that of every merchant in the South, wholesaler or retailer. We believe, too, that our credit system will be improved and that no longer will the planter insist on his merchant furnishing him goods on long time, and the merchant in turn making his jobber wait for months for his money. We believe that the process of liquidation and balancing accounts that has been going on for the past eight months is building up a purchasing power which when it starts will come like a whirlwind, and that it will be as much as we can all do to take care of business.

Addressing the members at the Wednesday meeting, W. Irving Bullard, vice-president and general manager of the E. H. Jacobs Mfg. Company, Danielson, Conn., said:

We are all familiar with the dissolution proceedings that have been forced upon our large so-called trusts, all of which have made higher prices for commodities produced by these great combines and, unless there is a more reasonable decision on this vital issue, the consumer will be forced to carry the burden by paying higher prices. As a concrete example, take the manufacturers of leather belting. The government contends that they cannot combine. Their gross business and net profits do not justify an independent selling organization for each manufacturer. What shall they do?

A committee was appointed to appear before the Southern Hardware Jobbers' Association which meets in New Orleans this week, to confer concerning the establishment of a joint trade report bureau to supply members with credit information. This is considered one of the most important moves of the association.

A banquet was held at the Piedmont Wednesday evening and on Thursday evening the annual ball was given at the Capital City Club. In addition there were many social events for the wives of the attending members.

The Dunham, Carrigan & Hayden Company, San Francisco, Cal., jobber of iron and steel, hardware, etc., is building a new office and warehouse across the street from its present location, provided with a spur railroad track and easy connection with rail and steamship lines near at hand. The new structure will have 208,000 sq. ft. of floor space and will probably be completed by August.

Rate Division with Steel Works Railroads Resumed

WASHINGTON, D. C., April 20, 1915.—Tariffs filed by the trunk lines, effective April 15, reinstating allowances to the Union Railroad, the Newburg & South Shore, the Lake Terminal, the Monongahela Connecting and the South Buffalo railroads have been accepted without suspension by the Interstate Commerce Commission. Of the five industrial roads involved the South Buffalo belongs to the Lackawanna Steel Company and the Monongahela Connecting to the Jones & Laughlin Steel Company, the other three being terminal roads of the United States Steel Corporation.

The action of the commission in permitting the trunk lines to resume their joint rate arrangements with the so-called industrial roads is regarded as the final step in the complete rehabilitation, so far as the iron and steel industry is concerned, of the system which was so severely denounced by the commission in its original report upon the Industrial Railroad case. The United States Supreme Court, in deciding collateral issues in the Tap Line case, cut the ground from under the commission and forced it to revise its rulings in the Industrial Railroad case, which revision was subsequently promulgated in a supplemental report. An inquiry has been made with respect to each of the iron and steel terminal railways for the purpose of ascertaining whether they are actually common carriers under the test prescribed by the Supreme Court. That the commission has found them to be such is demonstrated by its action in accepting the tariffs filed by the trunk roads restoring the joint rate arrangements.

The new tariffs filed by the trunk lines make important changes in the division of rates which was in force before the old arrangement was canceled, pursuant to the commission's order of April 1, 1914. By the terms of the original tariffs the terminal roads received 25 per cent. of any rate not exceeding 40 cents per ton, and if the rate were higher they received 10 cents a ton on inbound raw materials and 15 cents on outbound finished products. The tariffs which have just become effective allow the terminal roads a flat rate of 10 cents per ton, except in the case of the Lake Terminal, which is allowed only 8 cents.

There has been no decision of the interesting question whether the industrial lines are entitled to reparation for the rate divisions of which they have been deprived for more than a year, under the original decision of the commission. According to statements made in that decision these divisions run into millions of dollars. The tap line roads, established as plant facilities of other industries, are also interested in this phase of the case and it is probable that a test will be made of the issue in the near future.

W. D. C.

Proposed Freight Rate Changes in Texas

AUSTIN, April 19, 1915.—The iron and steel trade is interested in proposed changes of the commodity tariff on rails, track fastenings, and other iron and steel articles which have been submitted to the Texas Railroad Commission for approval as a part of a general increase of 15 per cent in the freight rates in Texas. A public hearing on the proposition will be held here May 3.

On rails and fastenings, in carloads, the present tariff reaches a maximum of \$2.70 per ton at 300 miles. It is proposed to carry the same figures up to 250 miles but to run the scale up to 450 miles, there reaching a maximum of \$3.75. The carload minimum, now 30,000 lb., is to be made 20 tons.

The proposed tariff is to be limited strictly to rails and track fastenings, while the present tariff also covers car axles, car springs, carwheels, cattle guards, semaphore material, switch stands, etc. On all these eliminated articles class rates will apply. Special rates between Houston and Galveston and between Galveston and Orange are omitted.

On iron and steel articles, under the present tariff, the scale of rates reaches 32c per 100 lb. at 380 miles. This it is proposed to change so that the same figure will be reached at 300 miles, which would mean 1c and 2c increases, except for over 380 miles.

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The Seamen's Law on the Pacific

The Pacific Mail Steamship Company, the only company operating vessels under the American flag in the transpacific trade, announces that all sailings after November 2 next have been canceled because of the new seamen's law, which will go into effect November 4. It is stated that the added cost of operation under this law makes the continuance of the service unprofitable. The company is now operating five ships. They are compelled to meet the competition of two Japanese lines, subsidized by their government, and a Canadian line subsidized by the British and Canadian governments. Of the Japanese lines the Toyo Kisen Kaisha receives \$1,340,000 gold per year, and the Otsuka Shosen Kaisha receives \$605,000 gold per year. The Canadian line receives \$218,000 gold per year. The steamships of the Pacific Mail Steamship Company are not receiving any subsidy or government aid whatever, but are being operated exclusively on private account. It is little wonder that the management of this company has become so disheartened by the added burden now imposed by the seamen's law as to give up the unequal fight. The retirement of this company, unless its vessels should be taken over by some other group of patriotic citizens, more able or more willing to sink their capital, will leave the Japanese and Canadian lines in undisputed control of our Pacific intercourse with the Orient. Thus does our ocean carrying trade go from bad to worse.

In this connection it is interesting to note that in his official address at the annual convention of the American Cotton Manufacturers' Association, held at Memphis, Tenn., April 14, President T. L. Hickman took a decided stand in favor of the United States subsidizing its merchant marine. He asserted that England and Germany had built up their enormous trade facilities in this way and hoped that the time would come when our Government would see the wisdom of adopting this policy. He declared that if we propose to undertake to transact an increasing volume of foreign trade we must prepare for it by having ships in which to haul our product, but the only way we can get people to invest their money in steamships until foreign trade is firmly established is to have Government aid.

We admire the courage shown by President Hickman in giving expression to his convictions, but it seems almost hopeless that the United States

Government will ever embark in support of such a policy. Instead of offering capitalists inducements to enter the foreign carrying trade, every Congressional movement in recent years has been in the direction of hampering those already engaged in this branch of commercial endeavor. The European war, with its demoralization of long established foreign navigation interests, presented an opportunity to this country which, if it had been embraced, would have enabled us to take a long stride in rehabilitating our merchant marine. This opportunity, however, is rapidly passing and the end of the war will doubtless see old conditions restored and our merchandise still shipped abroad in foreign bottoms. The comparatively small number of foreign-built ships which have been admitted to American registry since the outbreak of the war cannot be expected to remain permanently under our flag. It is to be feared that the handicaps imposed upon them by our laws will cause their owners to seek foreign registry when Europe becomes tranquillized and the ocean carrying trade resumes its antebellum condition. Our flag will then be seen only on our coasting vessels, war ships or ocean-going pleasure craft. It is a shameful prospect that faces those who would like to be considered statesmen.

Manufacturers' Associations in Politics

At last week's meeting of the National Metal Trades Association it developed that employers' associations have found a way to collective action on problems affecting manufacturing conditions, and especially political problems. The movement represents a more direct participation by the manufacturer than when he was wont to delegate the burden to his association's attorney. It is also crystallizing the acknowledged need of shaping legislation rather than opposing it. It has taken the form of a joint committee or conference board, with members appointed from the associations participating. In some cases the committees have been formed for a State jurisdiction and in others for work of national scope.

The conference board idea appears to owe itself to the safety and sanitation movement and to the desirability of getting the employers' case before the United States Commission on Industrial Relations. The attitude of the times toward the human element in shops is shared by the employer. Coercion has not been necessary to get him to improve

shop conditions. As a class he is ahead of compulsory legislation in this regard. He has seen the lack of uniformity of methods and the insufficiency of information, and the result is the National Affiliated Safety Organizations. Of the notable achievements of this conference board, readers of *The Iron Age* need no enumeration. It stands as a conspicuous example of altruism in industry, though it is safe to say that employers take no such credit for their interest, for they admit a pecuniary advantage.

The workability of collective representation when arrangements were finally made to get evidence of employers before the Industrial Relations Commission has shown the way to such associated effort in considering other problems. The success of committees of employers in a given State to consider workmen's compensation legislation has also made it easy to institute the new method with its promise of efficiency. Now in the same way a study is to be made of the part the manufacturer should take in politics for the shaping of legislation. As long as legislators pose as business experts, it is highly desirable that employers plan systematically to get before them their story, as men speaking of that which they know.

War Exports in Official Statistics

The war features of our exports continue to prove very interesting, as they appear in the detailed statement for February, just issued by the Department of Commerce.

The effect of the war has been so pronounced in decreasing the exports of passenger automobiles and greatly increasing the exports of trucks, officially known in the statistics as "commercial automobiles," that we give in detail the numbers exported by months since the beginning of 1913:

Number of Automobiles Exported

	Commercial			Passenger		
	1913	1914	1915	1913	1914	1915
January	87	45	935	2,070	2,481	1,803
February	83	57	1,002	2,388	2,837	2,230
March	108	50	...	2,734	3,538	...
April	84	52	...	2,682	3,239	...
May	141	99	...	2,895	3,157	...
June	115	90	...	2,039	1,982	...
July	44	50	...	1,720	1,265	...
August	68	66	...	1,936	385	...
September	48	128	...	1,711	646	...
October	79	672	...	1,697	732	...
November	64	842	...	1,707	776	...
December	88	1,279	...	2,301	1,297	...
Total	1,009	3,430	...	25,880	22,335	...

The decrease in the exportation of passenger automobiles was instant, being 68 per cent. merely from July to August. For the first five months of 1914 the exports ran ahead of those of the year previous by 20 per cent., while June showed a decrease from the preceding June and July a still greater decrease. Later the exports rose and in February of this year they were almost as large as in February, 1913. Under normal conditions presumably they would have been much larger, continuing the increase shown by 1914.

Unlike passenger vehicles, exports of trucks were much less in the early part of 1914 than in 1913. In September they were heavier than in any preceding month, barring May of 1913, and thereafter rose rapidly, but they have not increased continuously to date, neither January nor February of this year having as large exports as December. The

value of trucks exported in the six months ending with February averaged \$2837, or three times that of the trucks exported in the preceding 20 months. Evidently the so-called "commercial vehicles" exported in time of peace are in a totally different class from the "commercial vehicles" exported in time of war.

The February returns of spelter exports show that the partial returns compiled from day to day by the New York Metal Exchange, including only the exports from Eastern ports, are entirely misleading. Cotton vessels are taking spelter from Southern ports, and thus while the Eastern exports in February were reported some time ago at only a few thousand tons, the complete returns now show 13,394 gross tons, or approximately the same amount as the average of the five preceding months. In many quarters the belief had obtained that spelter exports decreased sharply after January. The first heavy exports were in September, 17,004 tons. The next five months, ending February, showed a total of 80,953 gross tons, at the rate of 16,191 tons a month or 194,000 tons a year (as against negligible amounts before the war). This rate is equivalent to 62 per cent. of the record production in 1914, recently reported by the Geological Survey at 353,049 net tons, or 315,222 gross tons. February showed a considerable increase in exports of brass in bars, plates, sheets, etc., as well as in manufactures of brass, also in cartridges, but all these items combined do not account for nearly as much spelter as the exports in metallic form, and are of relatively minor importance.

The exports of automobiles, passenger and commercial combined, showed an increase of 52 per cent. in value, in the six months ending February, as compared with the average of the 20 months preceding. The export spelter trade rose from practically nothing to very large proportions. It may be well now to look at two or three items on the other side of the ledger. The exports of agricultural implements in the seven months August to February inclusive amounted to \$3,570,415, against \$18,991,468 in the corresponding seven months a year earlier, showing a decrease of 81 per cent. Here the loss of trade thus far is at the rate of more than \$25,000,000 a year.

In electrical machinery and electrical goods the comparison of the seven months August to February inclusive shows a decrease from \$15,405,302 in 1914 to \$10,790,061 in 1915, or 30 per cent., the loss in trade being at the rate of nearly \$10,000,000 a year.

There is some compensation, however, in "explosives," the item next in order after "electrical machinery." The category includes cartridges, dynamite, gunpowder and "all other," but the increase in the seven-month periods we have been comparing is only from \$3,649,015 to \$11,888,480. The February figures alone show an increase of \$2,336,436 over February a year ago, but even that is at the rate of only \$28,000,000 a year, and is not a complete offset to the losses of \$35,000,000 in agricultural implements and electrical machinery.

Iron and steel exports in February, of which details appear elsewhere, made no material gain. The total value of all iron and steel, including machinery, hardware, etc., was \$16,470,751 in Febr-

ary, showing a decrease from the \$18,053,421 in January, but a gain over any preceding month since July. The weight of the tonnage items, 144,000 gross tons, slightly exceeded that of January, but fell short of October, being otherwise the best since last April. Inasmuch as the exports in 1912 averaged 245,000 tons a month, all these figures are low. In the February exports war materials figure largely, there being 20,000 gross tons of steel bars, doubtless chiefly for shrapnel.

Apprehensions that the end of the war may injure our export trade find no basis of fact in the statistics of exports of iron and steel or metal manufactures thus far presented. A stoppage in spelter exports would be regarded by our domestic consumers as a great advantage, but the spelter exports would decrease gradually rather than suddenly, in all probability.

Germany's Gain in Steel

A progressive increase has marked Germany's pig-iron and steel production since the first month of the war. This has taken place in spite of the heavy withdrawal of labor of all kinds and of railroad handicaps which cut down supplies of raw materials from both inside and outside the empire. Taking the rate of production before the war as standard, that at the end of 1914 was 55 per cent. of the normal in pig iron and 59 per cent. in steel, contrasting with but 35 per cent. of the normal in the first two months of the war. January and February showed further gains. Considering the tremendous strain upon the country and the summary cutting off of its export trade, the extent of this recovery is astonishing. In contrast were the conditions in the United States, in a time of profound peace, physically speaking—conditions which caused the cutting down of our steel production in November and early December to scarcely more than 35 per cent. of capacity. Here the war was a silent one, and legislation and industry were the belligerents. All present indications are that the conclusion of peace will find German iron and steel plants unharmed and the resources of the industry diminished chiefly by the loss of men. In Belgium the flooding of coal mines and the destruction of manufacturing plant or its serious crippling, added to the loss of life and the wiping out of homes will make the restoration of the status of the iron and steel industry slow and uncertain. France, next to Belgium, has had the most serious setback. But while more than half of her blast furnaces and steel works are under German control, they have not been destroyed, and after Germany's grip is relaxed should become gradually equal to supplying the wants of their own country. These will be many, since the area of devastation is great. Great Britain and Russia will find their most serious losses in the decimation of their industrial armies. For a time both will have much at home to occupy their steel works, and Great Britain may be called upon to supply Russia with a part, at least, of what Russia has heretofore drawn from Germany.

The immediate status of Germany as an exporter of steel products when peace comes again will depend less on the internal condition of the industry than upon the willingness of the countries now at

war with her to buy her products. In time it may be expected that prices and service will be determining factors. But nothing is likely to take the place of time in opening up markets now in the enemy's country. As we have observed before, it is hard to see how, in the many or few months, probably many, required for these readjustments, the eastern and western seaboard and the gulf sections of the United States will not be regarded, in these low-tariff times, as least resistant to the oncoming of Germany's post-bellum surplus. Rehabilitation will be a less pressing necessity in Germany than that of bringing money into the country through the sale of products at prices that will get them into other markets.

The Steel Corporation's Annual Meeting

The annual meeting of stockholders of the United States Steel Corporation was held on Monday, April 19, in the corporation's offices in Hoboken, N. J. Judge E. H. Gary, chairman of the corporation, presided. In reply to a question as to present and future conditions he said: "I am willing to talk frankly about the present and past, but am not so willing to talk about the future. Our business for 1915 is much better than 1914. We are doing a very satisfactory export business, but domestic conditions are not so good. We are running about 70 per cent. of capacity. Prices are and have not been satisfactory, and therefore our profits are small. I am glad to say that prices are going up a little, also the volume of business is increasing, and prospects for the next quarter seem to be considerably better. And if the volume remains the same earnings will be good, while an increase of business would, of course, mean better earnings."

Judge Gary, continuing his remarks, said: "We were sorry to hear that so many stockholders insisted that the common dividend be paid even if we had to reduce wages of our employees in order to do it. The management had been hoping and had expected to continue the payment of the dividend without interruption, but conditions were such that it was impossible. We were confronted with the choice of passing the dividend or reducing wages. In view of the present high cost of living, we believed the men were entitled to the wages they were receiving, which we think are not too much."

Six of the retiring directors were re-elected. P. A. B. Widener resigned and was succeeded by Henry Walters. The vacancy caused by the death of Norman B. Ream was not filled.

To Make Spiegeleisen at Duluth

The Dell Development Company, Duluth, Minn., of which Albert Parent is secretary, is now completing a plant in that city for the purpose of metalizing and separating the iron of manganese ore from the manganese. The enterprise is inspired by the large showing of manganese ores on the Cuyuna range in Minnesota, and it is stated that a long series of experiments has developed the practicability of the processes involved. The company also proposes to make spiegeleisen and high manganese pig iron. A smelting furnace of commercial size is now under construction, which is to be the forerunner of a plant of several units, the location of which will probably be at the mines.

Small Imports of Manganese Ore

Imports of manganese ore in February this year were practically nothing, 27 gross tons, compared with 15,020 tons in February, 1914. For the eight months ended with February total imports were 293,325 tons in 1913, 193,278 tons in 1914 and 158,587 tons in 1915, a progressive decrease. The imports for the last half of 1914 were 148,611 tons, compared with 154,123 tons in the last half of 1913.

To Prevent Piracy of Trademarks

WASHINGTON, D. C., April 20.—Pirating trademarks of American manufacturers in South America and some countries of Europe has become such an abuse that a strong movement is on foot to secure international agreements putting an end to the practice. Commissioner of Patents Ewing and First Assistant Commissioner Newton, who has direct charge of the trademark section of the Patent Office, are heartily in sympathy with the movement and can be relied upon not only to assist in securing the desired international agreements but also in obtaining from Congress such legislation as may be required to put them into force.

For several years complaints have been made by American manufacturers and exporters that they have found trouble in selling their goods abroad, especially in certain South American countries, because residents of those countries have registered the trademarks under which the goods in question were placed on the market. American exporters who have shipped goods to South American countries have been unable to remove them from the custom houses because of the registration of their trademarks by parties who have neither made nor sold goods under these trademarks, but who, apparently, have registered them for the sole purpose of "holding up" importers and compelling them to share their profits. Such a condition of affairs could not occur in the United States but can exist in numerous foreign countries because of the peculiar character of local trademark laws. Under the United States patent statutes a trademark belongs to the person who first actually uses it and in case of a contest concerning registration he alone is entitled to protection. In the leading South American countries and in Germany and certain other European countries, the first person registering a trademark has the sole right to its use. Assistant Commissioner Newton cites the case of a cash register company, which was compelled to pay a handsome bonus to certain Germans who had registered the company's trademarks in Germany.

Assistant Commissioner Newton calls attention to the convention drafted at a meeting of the Pan-American Union, held at Buenos Aires in 1910, which was intended to put an end to these abuses. It proposed a system of international registration, all the American republics being divided into two groups, the northern group having a registry office at Havana, Cuba, while the southern group had its office at Buenos Aires. Up to the present time the Buenos Aires convention has never been ratified, but under its terms the Havana registration office may be established upon the consent of one more country in addition to those that have already signified their concurrence in the arrangement. Less progress has been accomplished with reference to the southern group, but the important changes in commercial channels that have resulted from the European war are likely to have a potent effect in arousing interest in the subject.

The efforts of American manufacturers and exporters to secure the trade necessarily abandoned by their European competitors, because of the war, have served to emphasize the very unsatisfactory conditions with respect to trademark protection now existing. In some cases there is evidence that resident agents of foreign manufacturers have registered the trademarks of leading American producers in their lines, doubtless for the sole purpose of shutting out competing goods until the end of the war when, presumably, old trade relations will be resumed. The first step to reform existing conditions is believed to be the reawakening of interest in the Buenos Aires convention and its early ratification, provided it is not now obsolete, in which event the whole subject might be reopened through the Pan-American Union. Of equal importance would be the negotiation through the State Department of an international agreement with certain European countries, providing for the standardization of trademark registration requirements. Such an agreement could hardly be obtained before the end of the present war, but in view of the increase in commerce that will follow the reopening of trade channels the importance of adequate trademark protection cannot be overestimated. W. L. C.

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The Republic Company's Improvements

To correct statements heretofore published concerning the Republic Iron & Steel Company's financial and improvement plans, Chairman John A. Topping states that the proceeds of the recent \$2,000,000 bond sale to Blair & Co., New York, will be used on account of redemption of collateral notes maturing June 2, and to finance the cost of some improvements recently authorized. These improvements consist of an increase in by-product coke capacity of about 1000 tons a day and the centralization of power plants at the Brown-Bonnell works, Youngstown, Ohio, including installation of automatic coal handling devices and automatic stoker facilities; also the construction of a benzol refining plant at the by-product coke works which will have an annual capacity of about 950,000 gallons. These improvements will not increase the steel capacity, but will strengthen substantially the economic operations of the company as a result of by-product recoveries and reduction in labor costs.

The Universal Machine Company, Bowling Green, Ohio, is reported to have taken an order recently for \$100,000 worth of universal joints, which, with other orders, will keep its plant running night and day for some time. Orders have been placed for some additional equipment.

The Iron and Metal Markets

LAKE ORE SALES FOR 1915

Car Orders for Pennsylvania Railroad

Foreign Inquiries Increasing, But Little Change in the Volume of Domestic Business

The Pennsylvania Railroad's announcement that it is about to buy or build 16,500 cars and 194 locomotives and the tentative placing in this country of further large sections of the Canadian Car & Foundry Company's \$80,000,000 shrapnel contract have been the main contributions of the week to the news of better business. There is also the expectation that the Pennsylvania rail order will soon be distributed, adding 150,000 tons or more to the 20,000 tons already placed.

There are signs that other railroads are getting more alive to the low prices car and locomotive companies would make just now, and the steel trade looks for further developments in this direction. How far the large war contracts the equipment companies are now figuring on might affect deliveries of new cars that may be wanted by fall is a factor not entirely overlooked.

Of the \$80,000,000 Canadian contract for Russia, it is now known that over \$20,000,000 has been sublet in this country and that \$20,000,000 more is nearly closed. Much less clear is the status of other pending business, involving many millions, presumably for Great Britain.

Actual exports of iron and steel grow slowly, February showing a total of 145,000 tons for products reported by weight, against 140,000 tons in January. The rate of orders lately should give a 200,000-ton month soon. It is noticed this month that foreign inquiries are from a variety of new sources in neutral countries and the prices realized are often higher than on home business.

Ocean transport is a serious factor in business with Europe. Sweden wants American pig iron, but 80 shillings is asked for vessel room. Inquiries for thousands of tons of pig iron have come up, including 12,000 tons for Italian Government works and large amounts of hematite for England, but little is put through. A radiator company has bought 6000 tons of malleable pig iron at Buffalo for shipment to its plant at Hull, England.

The Lake Superior iron ore market has been opened for 1915 by sales of Mesaba non-Bessemer and of old-range Bessemer ores in the past few days, the total thus far being less than 1,000,000 tons. Prices, as expected, are the same as in 1914—a basis of \$3.75 at lower lake port for old-range Bessemer, \$3.50 for Mesaba Bessemer, \$3 for old-range non-Bessemer and \$2.85 for Mesaba non-Bessemer. Vessel rates are also the same as last year's.

The volume of new buying in finished lines continues to be less than in March. Shipments by some steel companies are less, also; by others substantially the same. The handling of the price situation in bars, shapes and plates has been apparently more effective from the producer's standpoint than at other times when demand was not

equal to capacity. In bars particularly the 1.20c. Pittsburgh, price has been established, and in the past week several producers have named 1.25c. as their price for third quarter shipments. This applies also to plates and structural shapes.

In the Pittsburgh and Valley districts the sheet bar market has quieted down lately after the active buying by sheet mills which had been idle in the deadlock over wages.

The foreign rail trade has shown a good deal of life, but British rail mills have had no hand in it, the government having well-nigh monopolized their output. The Tata works in India have taken 14,000 tons for government roads there, and the Dominion works in Nova Scotia are reported to have sold 35,000 tons more for South Africa, making 65,000 tons in all. The Broken Hill Proprietary Company, New South Wales, will roll 9000 tons for South Australia and probably 38,000 tons for New South Wales. In the domestic market a 6000-ton order for the Atlantic Coast Line has gone to the Tennessee Company, and there have been scattering orders of 7000 tons. The Chicago surface lines have placed 20,000 tons of girder rails with the Lorain Steel Company.

Structural operations are not yet what was expected from the opening of the building season. The Frick arcade building, 6000 tons, has been let at Pittsburgh, and bids are being made on the St. Louis free bridge and approaches which amount to 24,000 tons.

Pig iron has been more active in the districts tributary to Cincinnati and Chicago, though the buying has not assumed the proportions of a major movement. Concessions on Southern iron in some of the sales of two weeks ago have just developed, but in the past week \$9.50, Birmingham, has been more firmly established in Central Western districts.

At Pittsburgh prices on the lower grades of ferrosilicon have shown a decline of \$1 a ton or more. A leading steel casting company there is reported to have bought 900 tons of 11 per cent. metal at \$17 at Ohio furnace, but the market is now firmer.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month, and one year previous.

	Apr. 21	Apr. 14	Mar. 24	Apr. 22
Pig Iron, Per Gross Ton:	1915.	1915.	1915.	1914.
No. 2 X, Philadelphia...	\$14.25	\$14.25	\$14.25	\$15.00
No. 2, Valley furnace...	12.75	12.75	13.00	13.25
No. 2, Southern, Cin'ti...	12.40	12.40	12.15	13.75
No. 2, Birmingham, Ala...	9.50	9.50	9.25	10.50
No. 2, furnace, Chicago*	13.00	13.00	13.00	14.25
Basic, del'd, eastern Pa...	13.25	13.25	13.50	14.25
Basic, Valley furnace...	12.50	12.50	12.50	13.00
Bessemer, Pittsburgh...	14.55	14.55	14.55	14.90
Malleable Bess., Ch'go*	13.00	13.00	13.00	14.25
Gray forge, Pittsburgh...	13.45	13.45	13.45	13.65
L. S. charcoal, Chicago...	15.75	15.75	15.75	15.75

	Per Gross Ton.	20.00	20.00	20.00	21.00
Bess. billets, Pittsburgh.	20.00	20.00	20.00	21.00	
O-h. billets, Pittsburgh...	21.00	21.00	21.00	22.00	
O-h. sheet bars, P'gh...	25.00	25.00	25.00	25.00	
Forging billets, base, P'gh	22.02	21.52	21.52	23.40	
O-h. billets, Phila...	25.00	25.00	25.00	26.00	
Wire rods, Pittsburgh...					

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville,

	Apr. 21, 1915.	Apr. 14, 1915.	Mar. 24, 1915.	Apr. 22, 1915.
Per Net Ton at Oven:	1915.	1915.	1915.	1914.
Furnace coke, prompt...	\$1.50	\$1.50	\$1.50	\$1.55
Furnace coke, future...	1.65	1.65	1.65	2.00
Foundry coke, prompt...	2.00	2.00	2.00	2.40
Foundry coke, future...	2.15	2.15	2.15	2.50

Old Material, Per Gross Ton:

Iron rails, Chicago....	11.75	11.75	12.00	12.75
Iron rails, Philadelphia....	14.00	13.00	13.00	15.50
Carwheels, Chicago....	9.75	9.75	9.75	11.50
Carwheels, Philadelphia....	11.00	11.00	11.00	12.00
Heavy steel scrap, P'gh....	11.75	11.75	12.00	11.50
Heavy steel scrap, Phila....	11.00	11.00	11.00	11.00
Heavy steel scrap, Ch'go....	9.25	9.00	9.25	10.00
No. 1 cast, Pittsburgh....	12.00	12.00	12.00	11.50
No. 1 cast, Philadelphia....	12.00	12.00	12.00	13.00
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.00	10.25

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia....	1.15	1.15	1.15	1.20
Iron bars, Pittsburgh....	1.20	1.20	1.10	1.30
Iron bars, Chicago....	1.15	1.15	1.12 1/2	1.12 1/2
Steel bars, Pittsburgh....	1.20	1.20	1.15	1.15
Steel bars, New York....	1.369	1.369	1.319	1.31
Tank plates, Pittsburgh....	1.15	1.15	1.10	1.15
Tank plates, New York....	1.319	1.319	1.269	1.31
Beams, etc., Pittsburgh....	1.20	1.20	1.15	1.15
Beams, etc., New York....	1.369	1.369	1.269	1.31
Skelp, grooved steel, P'gh....	1.12 1/2	1.12 1/2	1.10	1.20
Skelp, sheared steel, P'gh....	1.17 1/2	1.17 1/2	1.15	1.25
Steel hoops, Pittsburgh....	1.25	1.25	1.25	1.25

Sheets, Nails and Wire,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh....	1.80	1.80	1.80	1.90
Galv. sheets, No. 28, P'gh....	3.25	3.25	3.40	2.90
Wire nails, Pittsburgh....	1.55	1.55	1.60	1.60
Cut nails, Pittsburgh....	1.55	1.55	1.55	1.65
Fence wire, base, P'gh....	1.35	1.40	1.40	1.40
Barb wire, galv., P'gh....	2.10	2.10	2.10	2.00

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York....	20.59	17.75	16.00	14.75
Electrolytic copper, N. Y....	17.37 1/2	16.37 1/2	15.37 1/2	14.25
Spelter, St. Louis....	11.35	9.75	9.35	5.00
Spelter, New York....	11.50	9.87 1/2	9.50	5.15
Lead, St. Louis....	4.00	4.12 1/2	4.05	3.70
Lead, New York....	4.20	4.20	4.10	3.80
Tin, New York....	46.50	57.00	50.50	35.60
Antimony, Hallett's, N. Y....	32.00	32.00	27.00	6.75
Tin plate, 100-lb. box, P'gh....	\$3.25	\$3.25	\$3.35	\$3.30

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal has no stability, being dependent on vessel charges.

Plates.—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.15c. base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, 1/4 in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered 1/4-in. plates. Plates over 72 in. wide must be ordered 1/4 in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Plates	Cents per lb.
Gauges under 1/4 in. to and including 3-16 in....	10
Gauges under 3-16 in. to and including No. 8....	15
Gauges under No. 8 to and including No. 9....	25
Gauges under No. 9 to and including No. 10....	30
Gauges under No. 10 to and including No. 12....	40
Sketches (including straight taper plates), 3 ft. and over	10
Complete circles, 3 ft. in diameter and over	20
Boiler and flange steel	10
"A. B. M. A." and ordinary firebox steel	20
Still bottom steel	30
Marine steel	40
Locomotive firebox steel	50
Widths over 100 in. up to 110 in., inclusive....	65
Widths over 110 in. up to 115 in., inclusive....	10
Widths over 115 in. up to 120 in., inclusive....	15
Widths over 120 in. up to 125 in., inclusive....	25
Widths over 125 in. up to 130 in., inclusive....	50
Widths over 130 in....	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive....	25
Cutting to lengths under 2 ft. to 1 ft., inclusive....	50
Cutting to lengths under 1 ft....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees, 3 in. and over, 1.20c.

Wire Products.—Prices to jobbers: Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots, annealed, \$1.35 to \$1.40; galvanized, \$1.90. Galvanized barb wire and staples, \$2.10; painted, \$1.60. Wire nails, \$1.55 to \$1.60. Galvanized nails, 1 in. and longer, \$1.20 advance over base price; shorter than 1 in., \$1.70 advance over base price. Woven wire fencing, 72 per cent. off list for carloads; 71 off for 1000-rod lots; 70 off for less than 1000-rod lots.

Wire Rods.—Bessemer, open-hearth and chain rods, \$25.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from February 11, 1915, and iron pipe from February 12, 1915, all full weight:

Steel		Iron	
Inches	Black	Galv.	Black
1/4, 1/4 and 3/8	73	52 1/2	66
1/2	77	65 1/2	65
3/4 to 3	80	69 1/2	69
		1/2 to 2 1/2	72

Lap Weld		Reamed and Drifted	
Inches	Black	Inches	Black
2	77	66 1/2	1 1/4
2 1/2 to 6	79	68 1/2	1 1/2
7 to 12	77	66 1/2	2
13 and 14	63 1/2	2 1/2 to 4	4
15	61	4 1/2 to 6	6
		7 to 12	8

Butt Weld, extra strong, plain ends		Lap Weld, extra strong, plain ends	
Inches	Black	Inches	Black
1/4, 1/4 and 3/8	68	55 1/2	5/8
1/2	73	64 1/2	1/2
3/4 to 1 1/4	77	68 1/2	3/4 to 1 1/2
2 to 3	78	69 1/2	2 and 2 1/2

Lap Weld, double extra strong, plain ends		Butt Weld, double extra strong, plain ends	
Inches	Black	Inches	Black
2	74	63 1/2	1 1/2
2 1/2 to 4	76	65 1/2	2
4 1/2 to 6	75	64 1/2	2 1/2 to 4
7 to 8	69	58 1/2	4 1/2 to 6
9 to 12	64	53 1/2	7 to 8
		9 to 12	58

To the large jobbing trade an additional 5 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from April 1, 1915, on steel, and from April 10, 1915, on iron, are as follows:

Lap Welded Steel	Standard Charcoal Iron
1 1/4 and 2 in....	66
2 1/4 in....	63
2 1/2 and 2 3/4 in....	69
3 and 3 1/4 in....	74
3 1/2 and 4 1/2 in....	75
5 and 6 in....	68
7 to 13 in....	65

Locomotive and steamship special charcoal grades bring higher prices.

1 1/4 in., over 18 ft., 10 per cent. net extra.

2 in. and larger, over 22 ft., 10 per cent. net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets	Cents per lb.
Nos. 3 to 8....	1.25 to 1.30
Nos. 9 to 10....	1.30 to 1.35
Nos. 11 and 12....	1.35 to 1.40
Nos. 13 and 14....	1.45 to 1.50
Nos. 15 and 16....	1.55 to 1.60

Box Annealed Sheets, Cold Rolled		Cents per lb.
Nos. 10 and 11		1.45 to 1.50
Nos. 12		1.45 to 1.50
Nos. 13 and 14		1.50 to 1.55
Nos. 15 and 16		1.55 to 1.60
Nos. 17 to 21		1.60 to 1.65
Nos. 22 and 24		1.65 to 1.70
Nos. 25 and 26		1.70 to 1.75
No. 27		1.75 to 1.80
No. 28		1.80 to 1.85
No. 29		1.85 to 1.90
No. 30		1.95 to 2.00

Galvanized Sheets of Black Sheet Gauge		Cents per lb.
Nos. 10 and 11		2.25 to 2.40
No. 12		2.35 to 2.50
Nos. 13 and 14		2.35 to 2.50
Nos. 15 and 16		2.50 to 2.65
Nos. 17 to 21		2.65 to 2.80
Nos. 22 and 24		2.80 to 2.95
Nos. 25 and 26		2.95 to 3.10
No. 27		3.10 to 3.25
No. 28		3.25 to 3.40
No. 29		3.40 to 3.55
No. 30		3.55 to 3.70

Pittsburgh

PITTSBURGH, PA., April 20, 1915.

The encouraging feature of the week is the expected inquiry of the Pennsylvania Railroad for over 16,000 cars, of which 7500 for the lines east and 6500 for the lines west are to be placed with car companies, and 2000 are to be built at the Altoona shops of the road. In addition are 500 to 600 refrigerator and other cars. Nothing has been said officially by the Pennsylvania Railroad as to when it expects to place the 150,000 tons of steel rails included in its estimate of 1915 needs sent out early in the year. If the road places these contracts, and it is reasonably certain that it will, it is believed others will come in the market soon and place orders for cars, engines and other track equipment. It is believed that low prices will be made on these cars for the possible effect it will have on other roads in inducing them to place orders. The general demand for plates and shapes is dull, and prices on plates are rather soft. Steel bars are the most active of any of the hot rolled products. Shipments of sheets and tin plate continue heavy, and galvanized sheets are reported firmer. The pig-iron market is quiet, and there is little doing in billets or sheet bars, as consumers are covered. The scrap market is at a standstill, but coke is showing more life, several good-sized inquiries for furnace coke being in the market. Bookings of the mills in April are not expected to be as heavy as in March, and shipments are likely also to show a falling off this month, as compared with last month. The Carnegie Steel Company is operating this week to 70 per cent. or better of ingot capacity, while the Youngstown steel mills continue to run to about 90 per cent. This week three or four steel plants of the Carnegie Steel Company are running to about 100 per cent., but others are not doing so well. The recent activity in the stock market is construed by some in the trade as the forerunner of more activity in the steel trade and higher prices. Another view is that unless the railroads come in, the steel mills will be back to a 50 per cent. operation or less by July 1.

Pig Iron.—Several expected large inquiries for foundry iron for last half delivery have not yet come out. Clinton furnace, now being prepared for blast, is installing a casting machine, and will be a maker of basic iron when the market warrants. Not enough pig iron is being sold to test the market. Nominal prices of pig iron are as follows: Bessemer iron, \$13.60; basic, \$12.50; malleable Bessemer, \$12.75; No. 2 foundry, \$12.75 to \$13; and gray forge, \$12.50, all at Valley furnace, with a freight rate of 95c. a ton for delivery in the Cleveland and Pittsburgh districts.

Billets and Sheet Bars.—Little is being done in new buying in billets or sheet bars, consumers being covered. Specifications are active. Orders sent to the mills for rolling by the billet and rail sales bureau of the Carnegie Steel Company up to April 20 were slightly in excess of the same period in March. Bessemer and open-hearth billets are still obtainable from the Youngstown district at slightly under the Pittsburgh price, less the freight to Pittsburgh. We quote Bessemer and open-hearth billets at \$19, and Bessemer and open-

hearth sheet bars, \$19.50, f.o.b. maker's mills, Youngstown; Bessemer and open-hearth billets, \$20, and Bessemer and open-hearth sheet bars, \$21, f.o.b. Pittsburgh. Forging billets are quoted at \$25 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take \$1 per ton extra. Axle billets are quoted at \$21 to \$22.

Ferroalloys.—A local steel casting company bought last week 900 tons of 11 per cent. ferrosilicon for forward delivery at a price that figures out around \$17 at Ohio furnace. The market is firmer since this sale was made, and it is not likely that the price could be duplicated. Other inquiry is out for low grades of ferrosilicon, and more business is expected to be closed soon. The ferromanganese situation looks better for the consumer and prices are easier. Carload lots of 80 per cent. English ferromanganese are quoted as low as \$90 to \$95, f.o.b. Pittsburgh. It is reported that two small cargoes have landed or are on their way from England. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at \$73; over 100 tons to 600 tons, \$72; over 600 tons, \$71; delivered in the Pittsburgh district. On 10 per cent. ferrosilicon the quotation is \$17; 11 per cent., \$18, and 12 per cent., \$19, f.o.b. cars, Jackson County, Ohio, or Ashland, Ky., furnace. We quote 20 per cent. spiegeleisen at \$25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads, 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Structural Material.—New inquiry is not much better, and low prices are being made on the small amount of new work that is being placed. The American Bridge Company has taken 6000 tons for the Frick Arcade to be erected in this city, and the Fort Pitt Bridge Works has taken 1245 tons for the new Shrine building to be erected in the East End. Local fabricators are bidding on about 24,000 tons for the St. Louis free bridge, bids to be closed May 10. We quote beams and channels up to 15-in. on new orders at 1.20c., Pittsburgh, for second quarter, and 1.25c. for third quarter. As yet there has not been much new buying at these prices.

Plates.—Local steel car companies expect to receive the coming week inquiry from the Pennsylvania Railroad for 7500 cars for the Lines East and 6500 for the Lines West, and for 500 or more refrigerator and other types of cars. The Pressed Steel Car Company has taken 15 steel passenger cars for the New York, Westchester & Boston. The new demand for plates is dull and prices are easy, a Cleveland mill being reported to be an aggressive seller. Two local interests are quoting 1.20c. on plates for second quarter, but some smaller mills are naming 1.15c. and in a few cases possibly a lower price.

Steel Rails.—No orders of moment for standard sections have been placed with the local mills for some time and none is in sight, except possibly the Pennsylvania Railroad order for 150,000 tons, which is being held up until tests, now being made, are completed. The new demand for light rails from the traction companies is active, but from the coal and lumber interests is quiet. The Carnegie Steel Company received in the past week new orders and specifications for nearly 3000 tons of light rails. We quote standard section rails made of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10 lb. section, 1.275c.; 12 and 14 lb., 1.225c.; 16 and 20 lb., 1.175c.; 25, 30, 35, 40 and 45 lb. sections, 1.125c. The prices of light rails are materially shaded on large lots, and the rerolling mills are underselling makers of rails rolled from billets from 50c. to \$1 per ton.

Sheets.—Prices on galvanized sheets are reported firmer, due to the higher market on spelter and the difficulty in getting prompt delivery. It is said that prompt spelter can hardly be had at any price. The new demand for black and galvanized sheets is fairly active, and sheet mills are operating from 70 to 90 per cent. or better. One or two mills that were naming 3.25c. on No. 28 galvanized sheets are now quoting 3.30c. or higher, but there are still some naming the

lower price. We quote No. 28 Bessemer black sheets at 1.80c. to 1.85c.; No. 28 galvanized at 3.25c. to 3.40c.; Nos. 9 and 10 blue annealed sheets, 1.30c. to 1.35c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Tin Plate.—Specifications against contracts from the can makers are not as active as they were some time ago, but shipments by the mills are still quite heavy, and there has been no decrease as yet in the rate of operations. New buying is light and only for small lots. The American Sheet & Tin Plate Company continues to operate at 96 per cent. of capacity, having practically all its hot-tin mills active. Several of the independent makers are operating to 100 per cent. On the small orders being placed, prices range from \$3.25 to \$3.35 for 14 x 20 coke plates, depending on the size of the order.

Wire Rods.—There has been no foreign inquiry for some time and domestic demand is also quiet. Consumers are covered on contracts up to July or later, and mills report that specifications are only fairly active. We quote Bessemer open-hearth and chain rods at \$25 to \$26, f.o.b. Pittsburgh. Small sales are reported at the higher price.

Steel Carwheels.—Should the Pennsylvania Railroad cars be placed, it will likely mean some orders for forged steel carwheels as well as for cast wheels. We quote standard 33-in. freight carwheels, 6 1/4-in. rough bore, at \$15, and standard 36-in. passenger, the same bore, at \$21 per wheel, f.o.b. Pittsburgh.

Shafting.—Prices are firmer and it is claimed the 70 per cent. discount is fast disappearing. Most makers are quoting 68 to 69 per cent., with one or two holding for the lower discount. Specifications from the machine-tool builders continue heavy, but from the automobile and implement makers are only fair. We quote cold-rolled shafting at 68 to 70 per cent. off in carload and larger lots, and 63 to 65 per cent. off in small lots, f.o.b. Pittsburgh.

Railroad Spikes.—There has been no new buying the past week. Most of the railroads have covered for their entire needs for this year. Specifications against contracts are only fair. We quote: Standard railroad spikes, \$1.35 to \$1.40; small railroad spikes, \$1.45 to \$1.50 in carload and larger lots, f.o.b. Pittsburgh.

Hoops and Bands.—So far few new orders have been placed for steel bands at the 1.20c. price for second quarter, as most consumers are covered up to July by contracts placed some time ago. The demand for steel hoops is quiet and specifications against contracts are only fair. We quote steel bands at 1.20c. on new orders for second quarter shipment, and 1.25c. for third quarter, and steel hoops at 1.25c. to 1.30c. at mill.

Skelp.—Local makers have more orders on their books than for some time, and prices are firmer. A large foreign inquiry for grooved steel skelp, amounting to 10,000 tons or more, is reported, but not confirmed. We quote: Grooved steel skelp, 1.12 1/2c. to 1.15c.; sheared steel skelp, 1.17 1/2c. to 1.20c.; grooved iron skelp, 1.50c. to 1.55c.; sheared iron skelp, 1.60c. to 1.65c., delivered to consumers' mills in the Pittsburgh district.

Wire Products.—While foreign inquiry for barb wire has quieted down considerably local mills are still making shipments abroad on orders taken some time ago. Several local barb wire makers report enough orders on their books to take their entire output for the next four or five weeks. Business in wire and wire nails will likely show a falling off from this time, as spring trade is pretty well over and prices are not very firm. Local makers of wire and wire nails are operating their plants at close to 100 per cent. of capacity, but state they have only a fair amount of work ahead. Makers quote to jobbers on new orders as follows: Wire nails, \$1.55 to \$1.60; galvanized nails, 1 in. and shorter, taking an advance of \$1.70 over this price, or \$3.30, and galvanized nails, 1 in. and longer, an advance of \$1.20, or \$2.80; plain annealed wire, \$1.35 to \$1.40; galvanized barb

wire and fence staples, \$2.10 to \$2.20; painted barb wire, \$1.60, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. for cash in 10 days. We quote woven wire fencing at 72 per cent. off in carload lots, 71 per cent. off on 1000-rod lots and 70 per cent. on small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—Specifications against contracts for steel bars are very heavy, the Carnegie Steel Company stating that its business up to April 20 is 50 per cent. ahead of the same period in March. It is evident that consumers of steel bars, knowing of the large contracts being placed for shrapnel, are afraid they may have trouble in getting deliveries, and as a result are anticipating their needs to some extent. As an example a rivet maker recently specified for 3000 tons, which is probably large enough to last him three or four months. Two or three implement makers have sounded the market on their needs of steel bars for the six months or the year beginning July 1. They are confronted with a price \$2 a ton higher than they paid for steel bars one year ago. The new demand for iron bars is slightly more active, but none of the mills is running to full capacity. We quote steel bars on new orders at 1.20c. for second quarter and 1.25c. for third quarter. We quote common iron bars, made from part scrap, at 1.20c. to 1.25c., and test iron bars at 1.30c., f.o.b. Pittsburgh.

Merchant Steel.—New demand for seasonable steels is fairly active, and shipments so far this month by the mills have been fully as heavy as in the same period in March. Prices are reported firm, and on small lots are as follows: Iron finished tire, 1/2 x 1 1/2 in. and larger, 1.30c. base; under 1/2 x 1 1/2 in., 1.45c.; planished tire, 1.50c.; channel tire, 3/4 to 1 1/2 in., 1.80c. to 1.90c.; 1 1/2 in. and larger, 1.90c.; toe calk, 1.90c. to 2c. base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c.

Cold-Rolled Strip Steel.—The new demand is fair and makers report that specifications against contracts are quite active. Prices are firm, \$2.80 base being obtained on small lots. We quote hard-rolled steel, 1 1/2 in. and wider, under 0.20 carbon, sheared or natural mill edges, per 100 lb., \$2.75, delivered. Extras, which are standard among all the mills, are as follows:

Thickness, in.	Extras for thickness	Extras for straightening and cutting to lengths not less than 24 in.	
		or intermediate tempers	Base
0.100 and heavier	0.25	0.25	\$0.10
0.099 to 0.050	0.25	0.25	0.15
0.049 to 0.035	0.20	0.25	0.15
0.034 to 0.031	0.35	0.40	0.25
0.030 to 0.025	0.45	0.40	0.40
0.024 to 0.020	0.55	0.40	0.50
0.019 to 0.017	0.85	0.50	1.10
0.016 to 0.015	1.25	0.50	1.10
0.014 to 0.013	1.95	0.50	1.25
0.012	2.30	0.50	coils only
0.011	2.65	0.50	coils only
0.010	3.00	0.50	coils only

Nuts and Bolts.—The new demand is only fairly active, most consumers being covered by contracts up to July. It is stated that discounts are being firmly held as follows:

<i>U. S. S. Cold Punched Blank and Tapped. Chamfered, Trimmed and Reamed</i>	
1/2 in. and smaller hex.	8.2c. per lb. off
5/8 in. and larger hex.	7.4c. per lb. off
Square, all sizes	5.9c. per lb. off

<i>Semi-Finished</i>	
1/2 in. and smaller hex.	85-10-10-10 off
5/8 in. and larger hex.	85-10-10 off

<i>Black Bulk Rivets</i>	
7/16 x 6 1/2, smaller and shorter	80-10-5 off

<i>Package Rivets 100 Pcs.</i>	
Black, metallic tinned and tin plated	75-10-10 off

Rivets.—Makers report the new demand quiet for structural and boiler rivets and low prices are being made. We quote structural rivets at 1.40c., and cone-head boiler rivets at 1.50c., f.o.b. Pittsburgh. On a desirable order these prices might be shaded about \$1 per ton.

Wrought Pipe.—Bookings of leading pipe mills up to April 20 showed a slight increase over the same period in March. Several fairly large orders for line pipe

for oil interests are in the market and one line, embracing about 50 miles, is likely to be given out within the next few days. Discounts on iron and steel pipe are being firmly held.

Boiler Tubes.—Following the recent action of steel boiler tube mills in increasing discounts, makers of charcoal iron tubes have taken the same action, discounts having been increased three points on some sizes and four points on others. As in the case of steel boiler tubes, all differentials have been wiped out and they are now being sold f.o.b. Pittsburgh. The new discounts on iron tubes more nearly represent the actual market prices, as the old discounts were materially shaded for many months. Discounts in effect on iron and steel boiler tubes are given on a previous page.

Old Materials.—The local scrap market is quiet. Prices here on heavy steel scrap are 50c. to 75c. a ton higher than are prevailing at Youngstown. We note sales of about 1000 tons of borings for forward delivery at \$8.25 to \$8.40; about 1000 tons of turnings at \$7.75 to \$8.; 500 tons of selected heavy steel scrap at \$11.75; 2000 tons to another mill at the same price, and about 700 tons of low phosphorus melting scrap at \$14, delivered at buyers' mills. Prices are unchanged but only fairly strong, due to the lack of new buying. For delivery in Pittsburgh and nearby districts that take Pittsburgh freights, dealers quote about as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	\$11.75 to \$12.00
Compressed side and end sheet scrap	10.25 to 10.50
No. 1 foundry cast	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	9.25 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	11.75 to 12.00
No. 1 railroad malleable stock	10.00 to 10.25
Railroad grate bars	8.50 to 8.75
Low phosphorus melting stock	13.75 to 14.00
Iron car axles	18.75 to 19.25
Steel car axles	13.25 to 13.75
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	9.75 to 10.00
No. 2 busheling scrap	7.00 to 7.25
Machine shop turnings	7.75 to 8.00
Old carwheels	10.75 to 11.00
Cast-iron borings	8.25 to 8.50
*Sheet bar crop ends	12.00 to 12.25
Old iron rails	12.75 to 13.00
No. 1 railroad, wrought scrap	10.75 to 11.00
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	10.75 to 11.00

*Shipping point.

Coke.—The coke trade is showing more activity. The Clinton Iron & Steel Company is negotiating for about 10,000 tons of coke per month, expecting to start its blast furnace in May. The contract of the Pittsburgh Steel Company for 18,000 to 20,000 tons of coke per month for the year beginning July 1 is expected to go to the interest supplying its coke at present; in fact, it is claimed the contract has been closed at a price equal to \$1.90 or \$2 per net ton at oven, but this is not confirmed. We quote standard makes of blast-furnace coke for prompt shipment from \$1.50 to \$1.60; on contracts for delivery up to July 1, \$1.65, and for delivery over all of 1915, at \$1.75 per net ton at oven. Foundry coke, standard makes, prompt, \$2 to \$2.25; contracts, \$2.15 to \$2.30. The output in the upper and lower Connellsville regions for the week ended April 10 is reported by the Connellsville Courier at 292,215 tons, an increase over the previous week of 10,964 tons.

Joseph G. Walton, resident manager of the Pittsburgh office of Eaton, Rhodes & Co., has been transferred to the main office at Cincinnati. The interests of the firm in the Pittsburgh district will hereafter be handled by Thomas R. Heyward, Jr., and the offices will be removed from the Oliver Building to rooms 1501-2 Farmers Bank Building, Pittsburgh.

The Mansfield Sheet & Tin Plate Company, Mansfield, Ohio, has placed a contract for an extension to its main building to be 60 x 140 ft. The company has received its last set of new rolls, and when these are installed the plant will consist of six complete units of 13 stands of rolls, comprising six hot mills, six cold mills and a roughing mill.

Chicago

CHICAGO, ILL., April 21, 1915.—(By Wire.)

A rather lean week, so far as the taking of new business is concerned, but with a uniform adherence to the price basis of 1.20c., Pittsburgh, for shapes and bars, is the groundwork of the period under review. Even the heavier specifying which has characterized recent weeks, as a result of special inducements under existing contracts, was lacking. There is no buying beyond what is necessary to cover the requirements that materialize from week to week. There are occasional spurts of railroad activity, such as are illustrated by the placing of 6000 tons of tie plates last week, the Illinois Central inquiry for 2000 tons of angle bars and the inquiry of the Northwestern for 2050 cars, which inquiry is still open. It is also reported that the rail programme of the Rock Island, involving the purchase of 15,000 tons, is to become effective shortly. The Chicago surface lines have bought 8000 tons of girder rails. With the exception of plates, for which a price equivalent to 1.10c., Pittsburgh, can still be obtained by close buyers, there is a decided firmness in the quotations made on structural shapes and bars, considering the disposition of many buyers to hold back from placing new business at this figure. Of pig iron there have been a number of sales of moderate size, including some activity in charcoal iron. Southern iron, for the time being, is the center of greater interest than local irons. Sales of heavy melting steel to the leading consumer constituted the principal activity in scrap in the week.

Pig Iron.—In the past week the greater part of inquiry aggregating 15,000 to 20,000 tons has been closed. This business has been placed almost exclusively for last half delivery and prices have been equivalent to \$13 at furnace for No. 2 foundry, where the iron has gone to Northern makers, and \$9.50, Birmingham, for Southern iron. The inquiry included a sprinkling of charcoal iron, a fair proportion of malleable Bessemer and a relatively increased tonnage of Southern iron. The needs of a number of regular buyers in this district remain to be covered, but the principal melters have very generally bought what they will require in the last half on the basis of conservative estimates. A considerable tonnage will doubtless be carried over into the second half at the rate at which foundries are now melting iron, but so conservative have been last half purchases that any material increase in business will necessarily involve additional purchases. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 2 to 5	\$15.75
Lake Superior charcoal, No. 1	16.25
Lake Superior charcoal, No. 6 and Scotch	16.75
Northern coke foundry, No. 1	\$13.25 to 13.50
Northern coke foundry, No. 2	13.00 to 13.25
Northern coke foundry, No. 3	12.50 to 13.00
Southern coke, No. 1 f'dry and 1 soft	13.75 to 14.25
Southern coke, No. 2 f'dry and 2 soft	13.50 to 13.75
Malleable Bessemer	13.00 to 13.25
Standard Bessemer	15.50
Basic	12.50 to 13.00
Low phosphorus	20.00 to 20.50
Jackson Co. and Ky. silvery, 8 per cent	16.90
Jackson Co. and Ky. silv'y, 10 per cent	17.90

(By Mail)

Rails and Track Supplies.—The Rock Island has made inquiry regarding deliveries applicable to 15,000 tons of rails and general currency is now given to the purchase of 7000 tons of Canadian rails by the Kansas City Southern, mentioned in this report two weeks ago. An order for 6000 tons of tie plates has been placed, bringing the purchases of one road, in the past month, up to more than 10,000 tons. The Illinois Central is buying this week about 2000 tons of angle bars. The Chicago surface lines, reported to have been in the market for girder rails in quantities up to 20,000 tons, have closed for 8000 tons with the Lorain Steel Company. We quote standard railroad spikes at 1.45c. to 1.50c., base; track bolts with square nuts, 1.90c., base, all in carload lots, Chicago; tie plates, \$23.25 to \$24.25, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails,

25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—In structural tonnage the week made but a modest showing. Specifications for plain material were less than in the preceding week and fabricating contracts recorded totaled only 2750 tons. The Nickel Plate Railroad placed a bridge, at Chicago, involving 2000 tons, with the Pennsylvania Steel Company. The 230 tons for the Grand avenue pier, Chicago, was awarded to the Federal Bridge Company. The inquiry of the Chicago & Northwestern for 2050 cars has not been closed and there are no other inquiries out of which there is a nearby promise of orders. While contracts are still in effect against which specifications are being taken at prices as low as 1.30c., Chicago, new business is being quoted on the basis of 1.389c., for second quarter, and 1.439c., for third quarter.

We quote for structural material out of jobbers' stock 1.75c., Chicago.

Sheets.—The price of spelter is once more shooting upward and the difficulty of securing deliveries is again extreme. This upward reaction has not resulted thus far in the withdrawal of the lower quotations on galvanized sheets, and 3.25c. at the mill can still be obtained. The local independent interest is still taking only a very limited number of orders and these on the basis of 3.40c., Pittsburgh. The fairly heavy business in black sheets continues at about the same level. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.489c.; No. 28 black, 1.939c.; No. 28 galvanized, 3.439c. to 3.589c.

We quote for Chicago delivery from jobbers' stocks as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 3.65c. to 3.75c.

Plates.—Although the leading mills appear to be adhering to 1.389c., Chicago, for plates and thereby are declining, for the first time in many months, to meet the competition of lower prices, desirable customers can place orders as low as 1.10c., Pittsburgh, while 1.15c. is a fairly easy price. We quote for Chicago delivery of plates from mill, for new business, 1.289c. to 1.389c., for second quarter delivery.

We quote for Chicago delivery of plates from store 1.75c.

Bars.—The active specifying against steel-bar contracts which attracted some attention a fortnight ago has moderated and now more accurately reflects the subnormal operations of the implement interests. Some of the bar-iron mills report a slight improvement in the volume of their business, but the change is insufficient to be of importance. Prices for both iron and steel are being quoted with practically no variations. We quote for mill shipments as follows: Bar iron, 1.15c.; soft steel bars, 1.389c.; hard steel bars, 1.20c.; shafting, in carloads, 65 to 68 per cent. off; less than carloads, 60 to 65 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off.

Rivets and Bolts.—The local market for rivets is weak. The bolt market is quiet and transactions are for the most part limited to the filling of specifications against contracts. Quotations are as follows: Carriage bolts up to $\frac{1}{2}$ x 6 in., rolled thread, 80-15; cut thread, 80-10; larger sizes, 75-17½; machine bolts up to $\frac{1}{2}$ x 4 in., rolled thread, 80-20; cut thread, 80-15; larger sizes, 80-2½; coach screws, 85-2½; hot pressed nuts, square, \$6.60 to \$6.40 off per cwt.; hexagon, \$7.60 to \$7.30 off per cwt. Structural rivets, $\frac{1}{4}$ to $1\frac{1}{4}$ in., 1.50c. to 1.55c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2c.; boiler rivets, 2.10c.; machine bolts up to $\frac{1}{2}$ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to $\frac{1}{2}$ x 6 in., 75-10; larger sizes, 70-15 off, hot pressed nuts, square, \$6, and hexagon, \$6.70 off per cwt.

Wire Products.—Although fall dating is now applicable to woven-wire fence orders, the trade has not yet taken hold actively. In the last week bookings were somewhat lighter. Wire-nail orders continue propor-

tionately heavier, as compared with business in this line during the past year. On galvanized products there is some shading of the top price by the jobbing interests. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.589; wire nails, \$1.789; painted barb wire, \$1.789; galvanized barb wire, \$2.289 to \$2.389; polished staples, \$1.789; galvanized staples, \$2.289 to \$2.389, all Chicago.

Cast-Iron Pipe.—The placing of 1000 tons of pipe at Peoria Heights, Ill., scheduled for April 19, and the 10,000 tons to be bought at Sacramento, Cal., April 20, are the only pipe business immediately in sight. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$25.50; 6 to 12 in., \$23.50; 16 in. and up, \$23, with \$1 extra for gas pipe.

Old Material.—The leading consumer of heavy melting steel is understood to have placed orders for several thousand tons within the past week, establishing a price for this grade of scrap, but in other directions the covering of old orders has been the extent of activity. The market is at a standstill with respect to prices. Scrap lists from the railroads include 4000 tons from the Rock Island Lines, about 600 tons from George W. Jennings and a blank list from the New York Central. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$11.75 to \$12.25
Old steel rails, rerolling	10.25 to 10.75
Old steel rails, less than 3 ft.	10.00 to 10.50
Old carwheels	9.75 to 10.00
Heavy melting steel scrap	9.25 to 9.50
Frogs, switches and guards, cut apart	9.25 to 9.50
Shoveling steel	8.75 to 9.00
Steel axle turnings	7.00 to 7.25

Per Net Ton	
Iron angles and splice bars	\$11.50 to \$12.00
Iron arch bars and transoms	11.75 to 12.25
Steel angle bars	8.50 to 8.75
Iron car axles	13.25 to 13.75
Steel car axles	10.50 to 11.00
No. 1 railroad wrought	8.50 to 8.75
No. 2 railroad wrought	8.00 to 8.50
Cut forge	8.00 to 8.50
Steel knuckles and couplers	8.00 to 8.50
Steel springs	8.75 to 9.25
Locomotive tires, smooth	8.50 to 9.00
Machine shop turnings	5.00 to 5.25
Cast borings	4.75 to 5.25
No. 1 busheling	7.25 to 7.75
No. 2 busheling	6.25 to 6.75
No. 1 boilers, cut to sheets and rings	5.50 to 6.00
Boiler punchings	8.25 to 8.50
No. 1 cast scrap	9.00 to 9.25
Stove plate and light cast scrap	7.75 to 8.00
Grate bars	7.50 to 7.75
Railroad malleable	8.00 to 8.25
Agricultural malleable	7.25 to 7.50
Pipes and flues	6.50 to 6.75

Philadelphia

PHILADELPHIA, PA., April 20, 1915.

The absorbing topic of the trade is the announcement that the Pennsylvania Railroad will spend \$20,000,000 for equipment, while the Lehigh Valley Railroad is expected to disburse \$1,000,000 in the same way, with other roads probably following suit. Considering the improved prospects of railroad business, the steadily growing exports, the big war demand and evidence of greater domestic activity in various directions, it is the consensus of opinion that the outlook today is better than it has been in years. The effort to hold to the basis of 1.20c., Pittsburgh, on second quarter delivery of plates, shapes and bars is uniform, and at present prices not much business is being sought for future delivery, although orders for the third quarter can be booked on a basis of 1.25c., Pittsburgh. Local mills have inquiries from the Pennsylvania Lines East and West of Pittsburgh aggregating 15,000 cars which, estimating roughly, will require upward of 200,000 tons of material. The agricultural implement makers are due to come into the market soon for their year's supply. Exports of blooms, billets, wire rods, barb wire and nails are going forward. The trade with merchants in steel products is holding up in a fairly satisfactory way, though many of these are moving old stock. Small projects involving structural material are more numerous. Both billets and sheets show an improvement. Furnace stocks of pig iron,

taken as a whole, have decreased since the first of the year. Scrap materials are not moving freely, but have a better tone.

Iron Ore.—The betterment which exists elsewhere has not yet made itself felt in the ore market. The only arrival of foreign ore reported in the week ended April 17 was 14,850 tons from Cuba. The total amount imported in March was 47,968 tons.

Pig Iron.—Furnace stocks taken as a whole have latterly decreased considerably. The larger proportion of the decrease is in foundry iron and the reduction is greatest in Alabama, which is pleasing in view of the fact that there has been such a large surplus of Southern iron. While stocks were larger April 1 than they were April 1, 1914, they are less today than they were January 1 of this year. It is evident, therefore, that deliveries have been even better than expected, though the manner in which they have been keeping up has been pointed to of late as one of the best phases of the situation. In the way of new business the week has been a rather good one. The transactions include about 2500 tons of charcoal iron in two lots, the quotation for which is \$15.75, Buffalo, or \$18.33, delivered here. Through local representatives of Virginia and Birmingham furnaces, Southern pipe makers have taken about 6000 tons in the past few days and several hundred tons of Virginia iron have been disposed of in other directions. A nearby maker of plumbers' materials has taken between 3000 and 4000 tons of No. 2 plain and a similar manufacturer in this city has taken 1000 tons. The recent buying of basic is understood to have terminated when 47,000 tons had been taken at prices ranging from \$13.15, delivered, to \$13.25. Quotations for standard brands for early delivery in buyers' yards in this district are as follows:

Eastern Penna. No. 2 X, foundry	\$14.25 to \$14.50
Eastern Penna. No. 2 plain	14.00 to 14.25
Virginia, No. 2 X, foundry	15.25
Virginia, No. 2 plain	15.00
Gray forge	13.25 to 13.50
Basic	13.25 to 13.50
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—Specific information as to when 80 per cent. ferromanganese will arrive here and in what quantity it will come appears to be lacking. Dealers say they know there are shipments afloat and this is all. It is not considered likely that advices will be received from England until the vessels are well on their way. The quotation is purely nominal at \$78, seaboard, with small quantities out of diminishing stocks selling at \$100 or more. For 50 per cent. ferrosilicon \$71 to \$73, Pittsburgh, is asked. A shipment of 21 tons arrived from England last week.

Bars.—Specifications for steel bars have been fair in volume, but the mills need more business. A few small orders have been taken at the new and generally accepted price of 1.359c., Philadelphia. Iron bars are quoted at 1.15c. to 1.20c., Philadelphia.

Plates.—Miscellaneous business has served to keep eastern Pennsylvania makers operating at around 85 per cent. of capacity and they expect to do better when the promised railroad buying develops. Inquiries were issued by the Pennsylvania Railroad last Saturday. It is pointed out that the freight cars which are to be built by the Pennsylvania Railroad itself will require about 20,000 tons of plates, and this is but one item. More ship business is indicated. Quotations are firm at 1.359c., Philadelphia, for second quarter delivery and 1.409c. for the third. There have been some additional shipments to England at a better price than can be obtained here and another shipment is destined for Delagoa Bay, Portuguese East Africa, probably for interior shipment to the Rand mines.

Rails.—The Pennsylvania Steel Company has taken an order from the Southern Railway for 1575 tons of rails. Inquiries are still pending for large tonnages of portable tracks, ties and incidental equipment required by France and Russia. Some of these would probably have been closed but for difficulties in arranging terms of payment. The question of exchange, especially with Russia, is a complex one.

Structural Material.—Small propositions continue to absorb the attention of the trade. Day & Zimmer-

man, engineers, Philadelphia, have asked bids for between 400 and 500 tons of structural shapes required by a new building to be erected for the N. O. Hickok Mfg. Company, Harrisburg. The Frankford Arsenal, Philadelphia, will take bids May 1 on about 200 tons to go into a shop building. The McClintic-Marshall Company has been awarded 250 tons for a Reading Railroad bridge. It is reported that 400 tons of concrete reinforcing bars required by the Cumberland Valley Railroad bridge at Harrisburg will be supplied by Davis Brothers, Philadelphia. The quotation is firmer at 1.359c., Philadelphia, for second quarter delivery.

Sheets.—The demand for sheets is improved, but quotations have not advanced from the range previously quoted, 1.459c. to 1.509c. for No. 10 blue annealed.

Billets.—While business cannot be called heavy, it shows improvement. Local makers are asking \$22.02, Philadelphia, based on \$19.50, Pittsburgh, for open-hearth rolling billets. Forging steel commands an extra \$4 to \$5, according to specifications.

Coke.—Quiet continues in both foundry and furnace coke, but the market is a little stronger because of increased consumption and promise of greater needs on the part of both furnaces and foundries. Quotations for prompt delivery, Connellsville furnace coke, are \$1.55 to \$1.65 per net ton at oven. Contract furnace to December 1 is quoted at \$1.75. Prompt foundry ranges from \$2 to \$2.35 and contract foundry at \$2.20 to \$2.35. Freight rates from the principal producing districts are as follows: Connellsville, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—Heavy melting steel is strong; dealers are asking up to \$11.50, but consumers are disinclined to pay more than \$11.25. The fact that the mills are doing better is imparting a general feeling of improvement. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel	\$11.00 to \$11.25
Old steel rails, rerolling	11.50 to 12.00
Low phosph. heavy melting steel scrap	14.25 to 14.50
Old steel axles	14.00 to 14.50
Old iron axles	17.50 to 18.00
Old iron rails	14.00 to 14.50
Old carwheels	11.00 to 11.50
No. 1 railroad wrought	12.75 to 13.25
Wrought-iron pipe	10.00 to 10.50
No. 1 forge fire	8.00 to 8.50
Bundled sheets	9.00 to 9.50
No. 2 busheling	7.75 to 8.25
Machine shop turnings	8.25 to 8.75
Cast borings	8.00 to 8.50
No. 1 cast	11.75 to 12.25
Grate bars, railroad	8.75 to 9.25
Stove plate	8.75 to 9.25
Railroad malleable	9.00 to 9.50

Cleveland

CLEVELAND, OHIO, April 20, 1915.

Iron Ore.—The Lake Superior ore market has been opened with the reported sale by a Pittsburgh interest of two lots of Mesaba non-Bessemer ore at \$2.85, the price that prevailed last year. These sales practically establish the price of this ore for the season and make it reasonably certain that prices on all grades will be the same as in 1914, as had been expected for some time. A buying movement is looked for within the next few days. However, it is not expected that a large tonnage will be sold at the present time. The ore shipping season started April 17 and some ore is now being sent down the lakes by steel interests owning their own ore properties. Some boat charters have been made at the same carrying rates as prevailed last year. The Pittsburgh Steamship Company will start its first boats April 23, or several days earlier than had been planned. We repeat 1914 prices as follows: Old Range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; old Range non-Bessemer, \$3.00; Mesaba non-Bessemer, \$2.85.

Pig Iron.—While the market is not active, quite a number of small lot sales of foundry iron are reported for the last half delivery, this business being for the most part for shipment outside of the immediate territory. One 500-ton lot went to a northern Ohio con-

sumer. A northern central Ohio stove maker is in the market for about 500 tons, one-half Northern and one-half Southern. Prices are unchanged at \$12.50 Valley furnace for No. 2, which is being met by Cleveland furnaces for outside shipment. Several inquiries for Southern iron aggregating about 2000 tons are pending for the last quarter delivery from consumers who will have enough iron left over from the first half to meet their third quarter requirements. These consumers want to cover for the last delivery at a \$9.50 price for No. 2, but dealers are asking \$9.75 for the fourth quarter. One producer has advanced his price to \$9.75 for any delivery, but the usual quotation for the last half is \$9.50. M. A. Hanna & Co. are planning to blow in their Canal Dover furnace in about 30 days. We quote delivered Cleveland, as follows:

Bessemer	\$14.55
Basic	13.45
Northern No. 2 foundry	\$13.25 to 13.50
Southern No. 2 foundry	13.50 to 13.75
Gray forge	13.00
Jackson Co. silvery 8 per cent. silicon	16.37 to 16.62
Standard low phos. at furnace	19.75 to 20.00

Coke.—The market is inactive. Specifications on foundry coke are fairly good, but there is practically no demand for spot shipment and no inquiries for contracts. We quote the best grades of Connellsburg foundry coke at \$2.25 to \$2.50 per net ton at oven. Furnace coke is held at \$1.50 to \$1.60 for spot shipment.

Finished Iron and Steel.—There is a good demand in finished lines both in specifications on contracts and in current orders. Some additional 1.25c. contracts for steel bars for the third quarter have been placed. Plate prices have stiffened up somewhat and some round lot orders for early shipment have been taken at 1.15c., Pittsburgh. However, this price is still being shaded, and the 1.10c. quotation has not disappeared. In spite of lower prices some business is being taken at 1.20c. and a few consumers having 1.15c. contracts for the second quarter have placed contracts at the \$1 a ton advance for additional second quarter tonnage for delivery late in the quarter. There is a good demand for tank plates but little call for boiler plates. The structural outlook has improved. The McMyler-Interstate Company, Bedford, Ohio, has taken 600 tons for an addition to the plant of the National Acme Mfg. Company, Cleveland, and bids have been received for 900 tons for a factory building for the Firestone Tire & Rubber Company, Akron, and 330 tons for a Toledo school, and bids will be taken this week for 2200 tons for bridges for the Chesapeake & Ohio Northern Railroad. There is a fair demand for hard steel bars for reinforcing purposes, which are selling down to 1.05c., Pittsburgh. The demand for bar iron is very dull. We quote iron bars at 1.20c. to 1.25c. for Cleveland delivery. An Ohio forge shop is in the market for 4000 to 5000 tons of forging billets for delivery over the remainder of the year. The demand for sheets is quieter and prices are somewhat irregular. We quote No. 28 black sheets at 1.75c. to 1.80c., Ohio mill; No. 28, at 3.25c. to 3.40c. and No. 10 blue annealed at 1.30 to 1.35c. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts have further improved and some of the leading makers are now operating their plants at 80 per cent. of capacity. Prices are being well maintained. The rivet market is quiet with prices unchanged at 1.40c. to 1.45c., Pittsburgh, for structural and 1.50c. to 1.55c. for boiler rivets. Bolt and nut discounts are as follows: Common carriage bolts, $\frac{1}{2}$ x 6 in., smaller or shorter, rolled thread, 80 and 15 per cent.; cut thread, 80 and 10 per cent.; larger or longer, 75 and 17 $\frac{1}{2}$ per cent.; machine bolts with h.p. nuts, $\frac{1}{2}$ x 4 in., smaller or shorter, rolled thread, 80 and 20 per cent.; cut thread, 80 and 15 per cent.; larger or longer, 80 and 2 $\frac{1}{2}$ per cent.; coach and lag screws, 85 and 2 $\frac{1}{2}$ per cent.; square h.p. nuts, black or tapped, \$6.40 off; hexagon h.p. nuts, blank or tapped, \$7.30 off; c.p.c. and t. square nuts, blank or tapped, \$6.10 off; hexagon, $\frac{1}{2}$ in. and larger, \$7.60 off; 9/16 and smaller, \$8.30 off; semi-finished hexagon nuts, $\frac{1}{2}$ in. and larger, 85, 10,

10 and 5 per cent.; 9/16 and smaller, 85, 10, 10, 10 and 5 per cent.

Old Material.—The demand for scrap shows some improvement. While mills generally are oversupplied at present and few will buy scrap for prompt shipment, some are taking on material for future delivery. Some local sales of heavy melting steel are reported at \$10.50 for new shop steel, and Youngstown mills have purchased several lots of heavy steel at \$11.25. A local dealer reports the sale of round lots of borings and turnings in Pittsburgh at \$8.75 for the former and \$8.25 and \$8.30 for the latter for future delivery. Local prices are unchanged. We quote f.o.b. Cleveland as follows:

Per Gross Ton	
Old steel rails, rerolling	\$11.00 to \$11.75
Old iron rails	12.00
Steel car axles	12.00 to 12.50
Heavy melting steel	10.00 to 10.25
Old carwheels	9.75 to 10.00
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	8.00 to 8.50
Railroad malleable	10.00 to 10.25
Steel axle turnings	8.75 to 9.00
Light bundled sheet scrap	8.00 to 8.50

Per Net Ton	
Iron car axles	\$15.50 to \$15.75
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	5.50 to 5.75
No. 1 busheling new	8.50 to 8.75
No. 1 busheling old	8.25 to 8.50
No. 1 railroad wrought	9.50 to 9.75
No. 1 cast	8.75 to 10.25
Stove plate	8.00 to 8.25

Buffalo

BUFFALO, N. Y., April 20, 1915.

Pig Iron.—Although new business is small for the week, melters are taking iron on existing contracts very freely and continue to anticipate deliveries, in some instances calling for immediate delivery on quotas scheduled as far ahead as midsummer. A few foundries and machine shops of the district are running night and day, indicating a general improvement in foundry melt. Notwithstanding this gratifying feature, business as a whole still lags and has not reached a normal level. There has been an unusually good movement noted recently in charcoal irons going into special castings, and prices have become very strong, with indications of an early advance. There is also a good deal of activity in high silicon irons running from 9 to 13 per cent. silicon. There is still an absence of a set schedule of prices for the different grades of foundry iron, as furnaces are not making a complete differential. Although a small amount of business is said to have been placed with one producer at under \$13, furnace, for nearby delivery, the majority of sellers are holding for \$13 minimum, covering grades from gray forge to No. 2 X foundry, \$13.25 to \$13.50 for No. 1 foundry, and \$13.75 for the higher or special silicons, f.o.b. furnace, current and third-quarter delivery. For charcoal iron the price range is \$15.75 to \$17.25 for ordinary grades and analyses, with some of the higher grades and special analyses held at \$19 to \$20, f.o.b. cars, Buffalo. A Buffalo furnace received the order for the 6000 tons of malleable for England recently placed through a radiator interest.

Finished Iron and Steel.—New inquiry and placement is on the whole rather limited, and specification on contracts is lighter for the week, although some agencies report a fair volume. One producing interest reports a good total of new business in plates and that its books are well filled with orders for 60 days to come. Prices are well maintained at 1.20c. for bars, shapes and plates through the second quarter. Some offerings are reported from users seeking to contract at current prices for third-quarter delivery, but mills are declining less than 1.25c., and are not anxious to quote for third quarter. Mills and agencies in this district are taking keen interest in the bar material requirements for the large foreign order recently booked by the American Locomotive Company, the bulk of which is to be turned out at the Brooks works at Dunkirk, N. Y. Some estimates figure the tonnage required as nearly 40,000. The Lackawanna Steel Company has taken an order for 250 tons of steel sheet piling from

the Eastover Construction Company, Utica, N. Y., for use in connection with a New York Central Railroad contract which they hold. There is an increase in demand for fabricated structural material, made up largely of small tonnage lots.

Old Material.—The market continues active both for local and out of town consumption, with heavy melting steel leading in demand. Most of the other lines have shown a good volume of transactions except cast scrap and malleable, the demand for which has been comparatively light. Dealers are confident the market will show increasing improvement the coming week. We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$10.50 to \$10.75
Low phosphorus steel	13.00 to 13.50
No. 1 railroad wrought scrap	10.00 to 10.50
No. 1 railroad and machinery cast	10.50 to 11.00
Old steel axles	12.00 to 12.50
Old iron axles	16.00 to 16.50
Old carwheels	10.50 to 11.00
Railroad malleable	9.50 to 10.00
Machine shop turnings	5.75 to 6.25
Heavy axle turnings	8.50 to 9.00
Clean cast borings	6.50 to 7.00
Old iron rails	11.00 to 11.50
Locomotive grate bars	9.00 to 9.50
Stove plate (net ton)	8.25 to 8.75
Wrought pipe	6.50 to 7.00
Bundled sheet scrap	7.25 to 7.75
No. 1 busheling scrap	8.50 to 9.00
No. 2 busheling scrap	6.00 to 6.50
Bundled tin scrap	9.00

Cincinnati

CINCINNATI, OHIO, April 21, 1915.—(By Wire.)

Pig Iron.—There is a marked increase in the tonnage of iron under negotiation as compared with the previous week, although there are comparatively few general open inquiries. Competition for business is keen and all salesmen are now working on the outside. Competitive efforts to secure business have not brought about any reduction in prices. However, one furnace in the Hanging Rock district that only occasionally produces foundry iron has been making some offers at \$12.50, Ironton basis, for prompt shipment. Only a very small lot of this iron is on the market. As very little prompt business is being done, only a few sales have been made by this furnace. Among the inquiries out for foundry iron is one from Evansville, Ind., for 3500 tons of mixed Northern and Southern. Two Ohio melters are in the market for 1000 tons each. An Indiana buyer is on the verge of closing for 1000 tons of Southern iron for last half shipment. A local melter has bought approximately 500 tons of Southern iron and a nearby foundry also contracted for the same tonnage. Southern producers are now holding firm at \$9.50, Birmingham basis, for either prompt or last half shipment. It is also stated that only a negligible quantity of Southern resale foundry iron can be bought for immediate shipment below this figure. About 600 tons of Lake Superior charcoal was taken by a Michigan melter last week, and the same consumer is expected to close this week for 1000 tons of Northern foundry. It is reported that a steel company in this territory, in whose product Southern iron rarely enters, has purchased a round lot of Southern basic to be used in filling a special order recently received. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	\$12.90 to \$13.40
Southern coke, No. 2 f'dry and 2 soft.	12.40 to 12.90
Southern coke, No. 3 foundry	11.90 to 12.40
Southern No. 4 foundry	11.40 to 11.90
Southern gray forge	10.90 to 11.40
Ohio silvery, 8 per cent. silicon	16.01 to 16.26
Southern Ohio coke, No. 1	15.01 to 15.51
Southern Ohio coke, No. 2	14.01 to 14.51
Southern Ohio coke, No. 3	13.76 to 14.01
Southern Ohio malleable Bessemer	14.26
Basic, Northern	14.26
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	26.90 to 27.40

(By Mail)

Coke.—Although there is some buying of small lots of foundry coke for prompt shipment, contracting has not begun to any extent and not much future delivery business is expected until about the middle of next month. Ordinarily consumers begin in April to contract for their last half requirements, while a few are

usually willing to cover for the entire 12 months at this season. Connellsville foundry coke is unchanged at \$2 to \$2.25 per net ton at oven, and contract figures range from \$2.10 to \$2.50. Some open offers of standard brands have been made at \$2.40 for shipment through the year. Wise County foundry is held at \$2.25 to \$2.50, the latter representing the future shipment quotation. The only inquiry out for 48-hr. coke from this territory is for 7500 to 10,000 tons for shipment through the next 12 months. This inquiry did not originate with a furnace interest, and it is understood the coke wanted is for domestic use.

Finished Material.—In some lines there has been an appreciable improvement in the inquiry. Orders now placed also call for larger tonnages, although many buyers are holding off on covering for future requirements. To some extent this applies to jobbers as well as consumers. It is understood that some backfire business has been received unexpectedly from agricultural implement manufacturers, whose contracts previously made were inadequate to take care of their wants through the season. The open weather, together with the absence of any labor troubles in this territory, has encouraged building operations, but most of the work now under way and in sight is for public buildings or residences not requiring any large amounts of metal construction material. Reinforcing concrete rods are in better demand, but there is not much improvement in either structural shapes or galvanized sheets. The mills in this territory are holding No. 28 galvanized sheets on a basis of 3.40c., Pittsburgh (though outside mills have quoted lower), and black sheets around 1.80c. to 1.85c., both for prompt shipment. We quote steel bars from warehouse stocks at 1.80c. f.o.b., Cincinnati.

Old Material.—Although there is a larger consumption of scrap by rolling mills and the majority of the nearby foundries, there has been no improvement in prices on any grades. The large stocks held by both the railroads and the scrap dealers are doubtless responsible for this condition. The minimum figures given below represent what dealers are willing to pay for delivery in their yards, southern Ohio, and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards:

Per Gross Ton		
Bundled sheet scrap	\$6.25 to	\$6.75
Old iron rails	10.50 to	11.50
Relaying rails, 50 lb. and up	19.25 to	19.75
Rerolling steel rails	9.75 to	10.25
Melting steel rails	8.50 to	9.00
Heavy melting steel scrap	8.50 to	9.00

Per Net Ton		
No. 1 railroad wrought	\$8.50 to	\$9.00
Cast borings	4.50 to	5.00
Steel turnings	4.50 to	5.00
Railroad cast scrap	9.00 to	9.50
No. 1 machinery cast scrap	10.25 to	10.75
Burnt scrap	6.50 to	7.00
Old iron axles	13.50 to	14.00
Locomotive tires (smooth inside)	8.50 to	9.00
Pipes and flues	5.75 to	6.25
Malleable and steel scrap	7.00 to	7.50
Railroad tank and sheet scrap	5.00 to	5.50

Birmingham

BIRMINGHAM, ALA., April 19, 1915.

Pig Iron.—Birmingham pig iron appears to be firm at \$9.50 for the entire last half. One or two makers, who are well sold up, are no longer seeking business but waiting for a rise. One interest, fully booked until August 1 and shipping more than its make, sold a lot of 5000 tons the past week for second half delivery in the South at \$9.50. Another sold lots of 4000 and 3000 tons respectively for Southern and Middle Western delivery for second half at the same price. An offer of \$9.25 for 1000 tons for the second half was declined. The bookings were largely of low grade irons, with No. 3 at \$9 and No. 4 at \$8.75. It is still probable that large lots of strictly spot iron might be secured in some quarters under \$9.50, but that price is certainly not the market. The inquiry has been brisk since April 10. Shipments are on a large scale with the exception of movements to nearby foundries, which are still holding back on their contracts. A unique feature of the situation is the storing of iron ordered by European takers. As much as 10,000 tons bought by Europeans is going

on the yards, a suggestion that the foreigner is speculating a little in the American product. There have also been instances of speculative purchases by domestic buyers, the total amounting to a considerable tonnage. This iron brought \$9.50 in each case. There seems to be a general conviction that iron has started on the up grade. We quote, per gross ton, f.o.b. Birmingham furnaces, for second half, as follows:

No. 1 foundry and soft	\$10.00 to \$10.25
No. 2 foundry and soft	9.50 to 9.75
No. 3 foundry	9.00 to 9.25
No. 4 foundry	8.75 to 9.00
Gray forge	8.50 to 8.75
Basic	9.50 to 10.00
Charcoal	22.50 to 23.00

Cast Iron Pipe.—It has been a quiet week in the water-pipe market, but orders on hand are sufficient to justify a continuation of 75 per cent. operations, while inquiries indicate good business to come. The sanitary pipe shops report an improvement in the demand, especially from the Middle West, from which Alabama shops are receiving considerable new business, owing to expansion in the building trades. A few shops are still idle, but the major portion have taken on a 60 per cent. gait. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., \$20; 6-in. and upward, \$18, with \$1 added for gas pipe.

Coal and Coke.—Coal is experiencing a slightly increased consumption by the railroads and factory interests and the movement to the coast is also larger. Beehive coke is in somewhat better demand. Shipments are being made to Texas with some regularity and the Western coast movement continues. We quote, per net ton, f.o.b. oven, as follows: Furnace coke, \$2.70 to \$2.95; foundry, \$3 to \$3.40.

Old Material.—Inquiry is brisker all round. Steel scrap is strong and machine cast is picking up for delivery outside the district. Very little stock is on hand. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	\$13.00 to \$13.50
Old steel axles	12.50 to 13.00
Old iron rails	12.00 to 12.50
No. 1 railroad wrought	8.50 to 9.00
No. 2 railroad wrought	7.50 to 8.00
No. 1 country wrought	8.00 to 8.50
No. 1 machinery cast	8.25 to 8.50
No. 1 steel scrap	8.00 to 8.25
Tram carwheels	8.25 to 8.50
Stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, Mo., April 19, 1915.

Pig Iron.—Demand for pig iron is of the hand-to-mouth character, transactions running down to the 100-ton lots and below. Shipments on contracts are going forward in a satisfactory degree with little or no tendency to request any withholding. In the past week there has been less heard of attempts by buyers of reputed ability to get pig iron at a lower figure than quoted by furnace representatives.

Coke.—No inquiries are at present in the market, but shipments on contract are going forward steadily. By-product coke is quotable at \$5.20 delivered St. Louis.

Finished Iron and Steel.—The big item of importance is the prospective letting, May 10, of the contract for the material for the east approach to the municipal bridge across the Mississippi. About 24,000 tons will be needed and it is expected that this will be fought for sharply. One of the problems involved which has not yet been settled is the attitude to be taken by the municipal authorities on the organized labor question in the work. Agricultural interests are taking material more freely than for some time and the movement in that direction is becoming quite heavy. The fabricating shop demand is not particularly good, because of the hand-to-mouth policy which keeps these interests out of the market except on actual contracts taken. On the smaller work they go to warehouses and pay the retail prices rather than commit themselves to contracts ahead. No business is appearing on tank plates, standard section steel rails or light rails. The movement out of warehouse is good and we quote as follows: Soft steel bars, 1.70c.; iron bars, 1.65c.; tank plates, 1.80c.; structural material, 1.80c.; No. 10 blue annealed sheets,

2c.; No. 28 black sheets, cold rolled, 2.55c.; No. 28 galvanized sheets, black sheet gauge, 3.65 to 3.75c.

Old Material.—The scrap market continues to sag as a result of the indisposition of the mills either to use scrap or to buy it for future consumption. Embargos are still on and will be until May 1 in many instances. The railroad lists previously reported have been pretty well cleaned up at low prices, but in some instances they held their material rather than let it go. The only new list out in the week was one of 600 tons from the Terminal Railroad of St. Louis. Relayers are still in demand and hard to get. There is no activity and not enough business doing to fix really definite prices. We quote dealers' prices, f.o.b. St. Louis:

<i>Per Gross Ton</i>	
Old iron rails	\$10.25 to \$10.75
Old steel rails, rolling	10.00 to 10.25
Old steel rails, less than 3 feet	11.00 to 11.50
Relaying rails, standard section, subject to inspection	21.00 to 23.00
Old carwheels	9.50 to 10.00
No. 1 railroad heavy melting steel scrap	9.25 to 9.75
Shoveling steel	8.50 to 9.00
Bundles, switches and guards cut apart	9.25 to 9.75
Bundles sheet scrap	5.75 to 6.25
<i>Per Net Ton</i>	
Iron angle bars	\$10.25 to \$10.75
Steel angle bars	8.25 to 8.75
Iron car axles	14.00 to 14.50
Steel car axles	10.25 to 10.75
Wrought arch bars and transoms	11.00 to 11.50
No. 1 railroad wrought	8.00 to 8.50
No. 2 railroad wrought	7.75 to 8.25
Railroad springs	8.50 to 8.75
Steel couplers and knuckles	8.50 to 8.75
Locomotive tires, 42 in. and over, smooth inside	8.75 to 9.25
No. 1 dealers' forge	7.25 to 7.75
Mixed borings	5.00 to 5.50
No. 1 busheling	7.25 to 7.75
No. 1 boilers, cut to sheets and rings	6.25 to 6.50
No. 1 railroad cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	6.00 to 6.50
Agricultural malleable	5.50 to 6.00
Pipes and flues	6.00 to 6.50
Railroad sheet and tank scrap	6.00 to 6.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	5.25 to 5.75

New York

NEW YORK, April 21, 1915

Pig Iron.—Some inquiry is reported in New York and nearby territory at points which eastern Pennsylvania furnaces can reach advantageously. Sellers are having a good deal to do with foreign inquiries and these may result in business, but the great drawback is transportation. On an inquiry of 2000 tons of pig iron for Sweden, for example, 80s has been quoted by vessel firms. The inquiry from Italy for 12,000 tons of foundry iron is presumed to be for government foundries. Both Southern and Northern makers are figuring on this. A radiator company is understood to have bought 4000 tons for shipment to its plant in England, the iron being lower in phosphorus than English brands. Buffalo furnaces made this sale. Several sales are reported locally, including one of good size and a number of smaller lots for Brooklyn. Hematite iron is still under inquiry for England and prices are attractively high, but only occasional lots are put through. One New York iron and steel firm has vessel connections that permit shipments to Great Britain, but the space is taken up with shipments of steel and non-ferrous metals, with little available for pig iron. Some further purchases of pipe iron are reported, including a round lot for a Virginia foundry, which went to Virginia furnaces. Southern iron is more firmly on a \$9.50 basis. We continue to quote as follows at tide-water: No. 1 foundry, \$14.25 to \$14.50; No. 2 X, \$14 to \$14.25; No. 2 plain, \$13.75 to \$14; Southern iron, \$14.50 for No. 1 and \$14 to \$14.25 for No. 2.

Ferroalloys.—One vessel, the Swanmore, bringing about 650 tons of ferromanganese from England, has reached Baltimore. Others of those mentioned last week are on the way and are expected at one or more ports this month. The amount released by this temporary lifting of the British embargo is variously estimated, but it is not far from 10,000 tons. The bulk if not all of this is for distribution only to consumers who merged their old contracts with new ones at the present quotation of \$78, seaboard. That the present

arrangement is only temporary and even liable to cancellation at any time is emphasized. It is also pointed out that the amount now coming by no means compensates for the normal receipts, for in the five months since the embargo was placed these would have amounted to about 40,000 tons. Advices from British producers are to the effect that the manganese ore situation there is black. Spot ferromanganese in limited quantities is obtainable in this market at \$100, seaboard, and some sales are reported at this figure. Ferrosilicon, 50 per cent., is in normal demand at \$71 to \$73, Pittsburgh, with both domestic and foreign inquiry and sales. Specifications on contracts are especially good.

Structural Material.—Forecasts do not give promise that the average volume of contracting for fabricated structures for the three months of the second quarter will exceed the average since the beginning of the European war. At the present time there are perhaps as much as 36,000 tons more or less active, but of this 19,000 is involved in the subway and other railroad work of New York City. One estimate is that as low as 25,000 tons will cover contracts placed in the next three months in the East, exclusive of New York subway work. If the motordrome project to utilize the old Sheepshead Bay race track, Brooklyn, is put through in the immediate future the tonnage estimate will be increased 4000 tons. For plain material there is better export inquiry and from sources which have not before applied to this country. Among new work appearing, the railroads are represented in 1000 tons for the Boston & Maine at Bardwell, Mass.; 300 tons for the Lehigh & New England; 300 tons for the Central Railroad of New Jersey for Pier 9, North River, Henry Steers, Inc., general contractor; and 450 tons for the Pennsylvania Railroad. Other new proposals include 800 tons for the Riverside power house of the Albany gas company; 400 tons for a grandstand at Harrison, N. J.; and 1000 tons for a warehouse for Brewster, Gordon & Co., Rochester. The awards embrace 500 tons for the Nagel Packing Company, Jersey City, to the Fagan Iron Works, and 600 tons for the Pennsylvania at North Philadelphia, to the American Bridge Company. Some 2200 tons additional elevated railroad extension work for the Interborough Company has been placed with T. A. Gillespie and associates as general contractors. We quote mill shipments at 1.20c., Pittsburgh, or 1.369c., New York, and from store, 1.85c. to 1.90c., New York. There are reports of some new business at lower than 1.20c. and it is admitted that a large tonnage would secure a price concession.

Plates.—The big event of the week is the unheralded inquiry of the Pennsylvania Railroad for 14,550 freight cars and 148 steel passenger cars. These are in addition to perhaps 2000 and more cars which the company will build in its Altoona shops, and the new buying will cover close to 200 locomotives. It is estimated that 150,000 to 185,000 tons of steel, much of it of plates, of course, will be required. Of the freight cars 8150 are for the Lines East and 6400 cars for the Lines West. Bids are asked for April 28. Besides these there are, as already reported, 1000 cars for the International & Great Northern; 2000 freight cars and 50 passenger cars for the Chicago & Northwestern, and also 100 cars for the Brooklyn subway system for the New York Municipal railways and 500 underframes for the Virginian, this last for extended deliveries. The only awards noted are 10 cars for the Wilkes-Barre & Hazleton and 10 for the Lehigh Traction, both awarded to J. G. Brill Company. We quote steel plates at 1.15c. to 1.20c., Pittsburgh, or 1.319c. to 1.369c., New York, and from store, 1.85c. to 1.90c., New York.

Iron and Steel Bars—Domestic business is slack. The takings of the agricultural machinery builders as observed in this market are disappointingly small, but withal prices remain firm, owing to the strong hands in which steel bar production lies and also because of an increasing expansion in demand for various lines of finished steel for export in addition to steel required for war material. In fact the sole encouragement lies in the relatively numerous export inquiries. We quote

mill shipments of steel bars at 1.20c., Pittsburgh, or 1.369c., New York, and refined iron bars 1.20c. to 1.25c., New York. Out of store in New York we quote iron and steel bars at 1.80c. to 1.85c.

Cast-Iron Pipe.—Pipe founders report a dearth of municipal lettings. Nothing of importance is at present in sight. The city of Binghamton, N. Y., awarded about 1100 tons, principally 20-in., to the Warren Foundry & Machine Company on Monday of this week. Private buying continues at about the normal rate for the season. Export inquiries are increasing, but difficulty is still experienced in securing satisfactory financial arrangements. Prices are firm. Carload lots of water pipe, class B and heavier, are quoted at \$22 to \$22.50 per net ton, tidewater, for 6-in., with class A and gas pipe selling \$1 per ton higher.

Old Material.—Although transactions have been light and inquiries from consumers are so few as to indicate a lack of interest, dealers are hopeful and prices are well maintained on all the principal classes of old material. While the large steel companies in eastern Pennsylvania have again begun to take in stock, they are notifying dealers to ship moderately so as to avoid another blockade. Consumption of scrap still continues under its normal volume. Brokers' quotations to local dealers and producers, per gross ton, New York, are as follows:

Old girder and T rails for melting	\$8.50 to	\$9.00
Heavy melting steel scrap	8.50 to	9.00
Relaying rails	19.00 to	19.50
Rerolling rails (nominal)	9.25 to	9.75
Iron car axles (nominal)	15.25 to	15.75
Steel car axles (nominal)	11.75 to	12.25
No. 1 railroad wrought	10.25 to	10.75
Wrought-iron track scrap	9.50 to	9.75
No. 1 yard wrought, long	9.50 to	9.75
No. 1 yard wrought, short	8.50 to	8.75
Light iron	3.25 to	3.75
Cast borings	5.50 to	5.75
Wrought turnings	6.00 to	6.25
Wrought pipe	7.50 to	8.00

Foundries have done less business in scrap than usual the past week. Their operations are either on a lower scale or they are using a larger proportion of pig iron in their mixtures. Quotations to consumers on cast scrap are as follows, per gross ton, New York:

Carwheels	\$8.75 to	\$9.00
No. 1 heavy cast, broken up	11.00 to	11.25
Stove plate	8.00 to	8.25
Locomotive grate bars	7.50 to	8.00
Malleable cast (railroad)	8.00 to	8.25

Boston

BOSTON, MASS., April 20, 1915.

Old Material.—The dealers agree with most business men in the metal industry that the general trend of demand is upward. Present fluctuations, however, as they are felt in the scrap market, are not especially significant and do not affect quotations. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. Mill prices are approximately 50c. per ton higher.

Heavy melting steel	\$8.25 to	\$8.50
Low phosphorus steel	13.75 to	14.75
Old steel axles	12.75 to	13.25
Old iron axles	20.25 to	20.75
Mixed shafting	12.00 to	12.25
No. 1 steel wrought and soft steel	8.25 to	8.75
Skeleton (bundled)	5.50 to	5.75
Wrought-iron pipe	7.00 to	7.50
Cotton ties (bundled)	5.25 to	5.75
No. 2 light	8.25 to	8.75
Wrought turnings	5.00 to	5.50
Cast borings	5.00 to	5.25
Malleable	7.50 to	7.75
Stove plate	7.00 to	7.50
Grate bars	5.25 to	5.50
Machinery cast (price to consumers)	11.25 to	11.50

The Moller & Schumann Company, manufacturer of varnish and enamels, Brooklyn, N. Y., has increased the selling staff of its Chicago branch, F. J. Keeley, for many years with N. Z. Graves Company, having been assigned to the territory skirting Lake Michigan, from Manitowoc, Wis., to Muskegon, Mich.

British Embargo on Foundry Iron

Strike Threatens Blast Furnaces—Rails for Indian and Australian Mills

(By Cable)

LONDON, ENGLAND, April 21, 1915.

Exports of foundry iron have been prohibited except under permit. A reaction in prices of Cleveland iron has followed due to this and to profit-taking. The furnaces in blast are 163 against 168 a year ago. Stocks of pig iron in Connal's stores were 136,386 tons at the close of last week against 132,700 tons one week previous. Steel prices are firm, but all industrial energies are concentrated on munitions of war. Private enterprise is diminishing.

American billets have been sold at £6 15s. (\$32.85), c.i.f. Liverpool. A strike among the Cumberland blast-furnace men is impending and threatens 17 hematite furnaces. Tin plates are firm but quiet. The Tata Iron & Steel Company of India has taken 14,000 tons of steel rails for India. The Broken Hill Proprietary Company of New South Wales is expected to book 9000 tons for South Australia and 38,000 tons of rails for New South Wales. It is reported that the Dominion Iron & Steel Company, Sydney, N. S., has secured 65,000 tons of rails for South Africa, which includes a 30,000-ton contract mentioned two weeks ago. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 17s. 1½d. (\$4.17) against 17s. (\$4.14) last week.

Cleveland pig-iron warrants, 65s. 10d. (\$16.02), compared with 66s. 10½d. (\$16.27) last week.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 65s. 9d. (\$16.00), against 66s. 9d. (\$16.24) a week ago.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £11 (\$53.53), against £10 15s. (\$52.31) a week ago.

Steel ship plates, Scotch, delivered local yards, £9, 15s. (\$47.44).

Steel rails, export, f.o.b. works port, £8 (\$38.93), compared with £7 15s. (\$37.71) a week ago.

Hematite pig iron, f.o.b. Tees, 105s. (\$25.55).

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 (\$34.06).

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £9 10s. (\$48.23), against £9 5s. (\$45.01) last week.

Steel bars, export, f.o.b. Clyde, £9 17s. 6d. (\$48.05).

Ferromanganese, f.o.b., £15 10s. (\$75.42).

Prices and Wages Soaring—Moderate American Sales—Ferromanganese Coming

(By Mail)

LONDON, ENGLAND, April 9, 1915.—Continually higher prices are being quoted for all descriptions of iron and steel, but the business transacted is exceedingly limited so far as merchants' requirements are concerned, and the restriction of business in pig iron is well exemplified by the following figures which set forth the monthly clearances in tons from the Tees district since the beginning of 1914.

1914	Coastwise	Foreign	Total
January	47,538	41,913	89,451
February	51,559	44,643	96,202
March	52,864	62,693	115,557
April	45,198	82,745	127,943
May	44,261	49,913	94,174
June	32,478	54,429	86,907
July	37,464	44,948	82,412
August	23,935	7,935	31,870
September	29,573	29,350	58,923
October	31,572	24,834	56,406
November	23,926	42,087	66,013
December	6,024	15,546	21,480
1915			
January	3,916	15,194	19,110
February	4,520	12,368	16,888
March	3,540	8,946	12,486

It will be seen from these figures that what was said in previous letters, and in cable advises aent the growing stagnation of general merchant business, is fully borne out by the facts; but it is to be hoped that we are now approaching the worst point in a very difficult position.

RECORD ADVANCE IN WAGES

Furnace owners are not only handicapped by the great difficulty which they experience in obtaining sup-

plies of ore, and by the monstrous prices of fuel, but are now faced with increasing wages in all directions. For instance, there has been a record advance in the wages of the Cumberland and North Lancashire blast-furnace men. These are determined over a sliding scale, based on the average selling price of hematite warrants, which average for the past quarter was 82s. 9d. (\$20.14) per ton, compared with 64s. 7d. (\$15.71) in the October-December quarter. The furnace workers, therefore, receive an advance of 22½ per cent., bringing their wages to 53 per cent. above the standard. The colliers are demonstrating furiously for a 20 per cent. advance in wages and their demands will no doubt have to be conceded. Not only is labor becoming exceedingly scarce, but the standard of quality is decidedly indifferent, the better men having followed their natural instincts and gone to the war, leaving behind the born-tired and weaklings. The ore position is exceedingly difficult, particularly as regards hematite, and the occasional blowing up by the Germans of ore-laden ships introduces an additional element of difficulty. The British steamer Northlands, for instance, was torpedoed a few days ago when on her way to Middlesbrough with ore. Production is, of course, very moderate and there has been a considerable amount of excitement in the speculative market, while prices in some influential quarters are talked very much higher.

At an active meeting of the iron trade in Birmingham this week the drift of sentiment was entirely favorable to further price advances. An improvement was reported in the January-February output of finished iron in the Midlands accompanied by an advance in selling prices of 8d. (16c.) a ton to £7 8s. 9d. (\$36.19). The change is too small to involve any alteration in wages, which remain at 9s. 9d. (\$2.37) a ton for iron workers with a bonus to the puddlers of 6d. (12c.) a ton. Steel prices are soaring, and it is really hard to figure on very close figures, for works are so fully booked that they do not care to quote, and in any event are unwilling to commit themselves further, until assured of being able to cover themselves in raw material. There has been a moderate amount of semi-finished American steel sold to this side, and the last business reported was done at about £6 10s. (\$31.63) c.i.f. Liverpool, but in view of the upward tendency of freights it is a little doubtful whether further business could be booked by consumers at the same price.

SHIPBUILDING VERY ACTIVE

The enormously profitable character of shipping business is leading to some building programmes being discussed, but considerable difficulty is found in placing orders with the shipyards, which have too much Government work on hand to be very keen about private contracts, and the Government is taking good care not to allow private business to stand in the way of the timely fulfilment of its own contracts. The output of the shipbuilding yards on the Clyde during March was 40,245 tons, an increase of 12,791 tons compared with March, 1914, and the launchings during the first quarter of the year were about 104,000 tons, an increase of 3000 tons over last year. These figures are, of course, exclusive of Government work.

There has been some fair business doing in tin plates, but American competition is being felt rather sharply, and considerable disappointment has been caused by the loss of orders for the far East and for South America. Makers here assert that America is taking ridiculously low prices to secure business, and they give details which certainly seem to confirm what they say. The galvanized sheet trade is still very indifferent but mills seem now to be working at about 50 per cent. of their capacity.

There is nothing new regarding ferromanganese, shipments of which are being made regularly in connection with the permits which have recently been granted.

The Edward R. Ladew Company, Inc., New York, has removed its offices from 84 Fulton street to 133-137 Centre street.

Metal Market

NEW YORK, April 21, 1915.

The Week's Prices

Cents Per Pound for Early Delivery										
Apr.	Copper, New York	Electro- lytic	Tin, New York	Lead		Spelter		Cents		
				New York	St. Louis	New York	St. Louis			
14	17.75	16.50	55.00	4.20	4.10	10.00	9.85			
15	18.00	16.62 1/2	53.00	4.20	4.10	10.25	10.10			
16	18.50	16.87 1/2	50.50	4.20	4.10	10.50	10.35			
17	18.75	17.00	49.50	4.20	4.10	10.75	10.60			
19	20.00	17.37 1/2	49.50	4.20	4.10	11.25	11.10			
20	20.50	17.37 1/2	46.50	4.20	4.10	11.50	11.35			

Under good demand copper has continued to advance. Tin is considerably easier following the arrival of spot metal. Lead is easier both in the West and at London. A good demand, with a scarcity of prompt metal, has caused spelter to advance. The scarcity in antimony is unrelieved.

New York

Copper.—A heavy business has been done, especially in the latter part of last week. Both Lake and electrolytic were taken in quantities which account for a sharp rise in their quotations. The prices asked yesterday were 20.50c. for prime Lake and 17.37 1/2c., cash, New York, for electrolytic. Less choice brands of Lake were quoted at 18c. to 20c., while some special brands easily brought 21c. This week buying eased off, which is attributed to the high prices. The producers have unquestionably increased their production, but it is believed that they are well sold up for some time to come. The character of the buying is unchanged, practically all of the metal taken being destined for war materials. Exports this month total 9609 tons. The bulk of the metal now being purchased will soon go abroad in the form of finished products. The base price of hot rolled sheet copper has been advanced to 22 1/2c.

Tin Plate.—The market is easier because of the arrival at Boston of three steamers with approximately 1200 tons of tin which has come direct from the Far East. The increased supply brought the market down to 46.50c., New York, yesterday. This relief does not promise to be permanent because of the attitude of the British Government in strictly regulating business in tin. The restrictions have heretofore been referred to. In an effort to have them modified a committee of the New York Metal Exchange recently went to Washington and conferred with Sir Richard Crawford, special agent of the British Government, but came away with small satisfaction. England intends to prevent, if she can, the accumulation of spot stocks in this country. Her desire is to have tin pass into the hands of consumers as directly as possible and this the dealers regard as inimical to their interests. It has also looked as if there was trouble ahead for the retailer, but it was suggested by Sir Richard that the restrictions might be modified to relieve the situation in this respect. The business of the week has been quiet and almost entirely in small lots of spot metal. Early last week some small parcels were shipped from London in order that advantage might be taken of the premium then prevailing. In the last day or two prices have been nominal to a degree more pronounced than at any time in the memory of the trade. Variations in daily quotations make it difficult to give a price and averages have been taken. The arrivals this month total 870 tons, and there is afloat 5635 tons, of which 1330 tons is Banca tin.

Lead.—The New York quotation is unchanged at 4.20c., but St. Louis is a trifle weaker at 4.10c. The chief topic of the trade is the weakness which has developed in London. A point was reached April 16, where exports to London were automatically stopped. The London price on that day, £20 7s. 6d., was equivalent to 4.40c., which with ocean freights and insurance does not allow a sufficient margin for profitable exportation. The home market has not enthused over the situation and more pressure to sell has come about. Consumers are waiting to see what London will do. Exports up to April 20 total 2973 tons.

Spelter.—With the supply seemingly inadequate, and more buyers than sellers in evidence, the market has advanced until yesterday 11.50c., New York, and 11.35c., St. Louis, were the approximate quotations for prime Western. Choice brands sell higher. Producers appear to be well sold up. Future deliveries partake of the strength of spot metal for prompt shipments from the West. Exports up to April 20 total 2799 tons.

Antimony.—A large inquiry is rumored but has not been specifically reported. Quotations for English brands are nominal at 32c. for Hallett's and 35c. for Cookson's. Chinese can be had at 21c. to 22c.

Old Metals.—The market continues active and higher prices prevail. Dealers' selling quotations are as follows:

	Cents
Copper, heavy and crucible	15.75 to 16.00
Copper, heavy and wire	15.25 to 15.75
Copper, light and bottoms	13.50 to 14.00
Brass, heavy	10.50 to 10.75
Brass, light	8.00 to 8.50
Heavy machine composition	13.00 to 13.25
No. 1 yellow rod brass turnings	10.00 to 10.25
No. 1 red brass or composition turnings	10.50 to 11.00
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	7.00

Chicago

APRIL 19.—While quotations for choicest brands of Lake copper run as high as 21c., most Lake brands are regularly quoted at 17.50c. to 18c. Tin prices have experienced a decided slump. Interest attaches to the renewed upward movement in spelter and its increased scarcity. Old metal prices, sympathetically affected, are higher for copper and the copper alloys, and lower for the other metals. We quote as follows: Casting copper, 16.75c. to 17c.; Lake copper, 17.50c. to 18c., for prompt shipment; small lots, 1/2c. to 1c. higher; pig tin, carloads, 49c., small lots, 51c.; lead, desilverized, 4.12 1/2c., and corroding, 4.35c., for 50-ton lots; in carloads, 2 1/2c. per 100 lb. higher; spelter, nominally, 11c. to 11.50c.; sheet zinc, 13.50c., or price ruling date of shipment; Cookson's antimony, 32c., for cask lots; other grades, 25c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 13.50c.; copper bottoms, 12c.; copper clips, 13c.; red brass, 11c.; yellow brass, 9c.; lead pipe, 3.37 1/2c.; zinc, 7.25c.; pewter, No. 1, 27c.; tinfoil, 32c.; block tin pipe, 37c.

St. Louis

APRIL 19.—The non-ferrous metals are strong in this market. Lead is quoted today at 4.35c.; spelter, 11.50c.; tin, 52c.; Lake copper, 17.50c.; electrolytic copper, 17.35c.; Cookson's antimony, 33c. The Joplin zinc ore market has firmed up, with prices ranging from \$54 to \$60 for basis ore and top settlement \$63. Calamine sold at \$29 to \$34, with the premium settlement at \$38.50. Lead ore was unchanged at \$51. In miscellaneous scrap metals there has been an upward tendency and quotations are as follows: Light brass, 7c.; heavy yellow brass, 8.50c.; heavy red brass and light copper, 10.75c.; heavy copper and copper wire, 13.50c.; pewter, 22c.; tinfoil, 36c.; zinc, 7c.; lead, 3.50c.; tea lead, 3.25c.

Emil Baerwald will remove his office April 26 from 2 Rector street to 61 Broadway, New York. He represents Lewis Lazarus & Sons, London, in the sale of ores, metals and tin plates.

The National Association of Brass Manufacturers met at the Hotel Statler, Detroit, Mich., April 14 and 15. A poll of the meeting indicated a rather encouraging condition in the brass line throughout the country, showing plants running from 75 to 90 per cent. of their normal capacity, several members reporting full time and capacity. Having received reports of a considerable advance in freight rates via Panama Canal to Pacific coast points, it was concluded to petition the Interstate Commerce Commission to restore the less-than-carload west-bound transcontinental tariff rates, which were recently increased about 50 per cent. The next meeting will be held at Niagara Falls, N. Y., June 29 and 30.

Iron and Industrial Stocks

NEW YORK, April 21, 1915.

Continued activity has characterized the stock market. On some days the excitement on the New York Stock Exchange surpassed anything experienced since the famous movement of 1901. Bethlehem Steel common did not maintain the high level it reached the previous week, but there was no such collapse as had been expected. Other industrial stocks, notably those of equipment companies, made remarkable gains. Conspicuous strength was displayed in the United States Steel and Republic stocks. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	14 - 20	Pressed Stl., pref.	94 - 96 $\frac{1}{8}$
Allis-Chal., pref.	51 $\frac{1}{2}$ - 56 $\frac{1}{2}$	Ry. Spring, com.	28 $\frac{3}{8}$ - 36 $\frac{1}{2}$
Am. Can., com.	34 $\frac{3}{4}$ - 39	Ry. Spring, pref.	90 - 95
Am. Can., pref.	98 $\frac{3}{4}$ - 99	Republic, com.	25 $\frac{7}{8}$ - 34 $\frac{1}{2}$
Am. Car & Fdy., com.	49 $\frac{3}{4}$ - 59 $\frac{1}{4}$	Republic, pref.	83 - 88 $\frac{1}{2}$
Am. Car & Fdy., pref.	115 $\frac{1}{2}$	Rumely Co., com.	3 $\frac{1}{2}$ - 4 $\frac{1}{2}$
Am. Loco., com.	36 - 68	Rumely Co., pref.	8 - 11
Am. Loco., pref.	93 - 100 $\frac{1}{4}$	Sloss, com.	34 - 42
Am. Steel Fdries	31 $\frac{1}{2}$ - 37 $\frac{1}{2}$	Pipe, com.	11 - 16 $\frac{1}{2}$
Bald. Loco., com.	40 - 55 $\frac{1}{2}$	Pipe, pref.	42 - 46 $\frac{1}{2}$
Bald. Loco., pref.	102 - 103	U. S. Steel, com.	56 $\frac{3}{4}$ - 60 $\frac{1}{2}$
Beth. Steel, com.	128 - 145	U. S. Steel, pref.	108 $\frac{1}{2}$ - 109 $\frac{1}{2}$
Beth. Steel, pref.	110 $\frac{1}{2}$ - 112	Va. I. C. & Coke	44 - 45
Case (J. I.), pref.	80 - 83 $\frac{1}{4}$	West'g'h'se Elec.	78 - 89
Colorado Fuel	31 $\frac{1}{2}$ - 36 $\frac{1}{2}$	Am. Ship, com.	30 - 34
General Electric	149 - 155 $\frac{1}{2}$	Am. Ship, pref.	70 $\frac{1}{2}$ - 71
Gr. No. Ore Cert.	38 - 41	Chic. Pneu. Tool	56 - 59 $\frac{1}{2}$
Int. Harv. of N. J., com.	99 - 106 $\frac{1}{2}$	Cambria Steel	47 $\frac{1}{2}$ - 50
Int. Harv. Corp., com.	75	Lake Sup. Corp.	54 - 10 $\frac{1}{2}$
Int. Pump, com.	2 - 6 $\frac{1}{2}$	Pa. Steel, pref.	59 - 60 $\frac{1}{2}$
Int. Pump, pref.	9 - 15 $\frac{1}{2}$	Warwick	9 $\frac{1}{2}$
Lackawanna Stl., com.	33 - 43	Cruc. Steel, com.	15 $\frac{1}{2}$ - 23
Nat. Enam. & St., com.	15 - 16 $\frac{1}{4}$	Cruc. Steel, pref.	81 $\frac{1}{2}$ - 87 $\frac{1}{2}$
Pressed Stl., com.	35 $\frac{3}{4}$ - 45	Harb. Walk. Ref., pref.	98
		La Belle Iron, com.	29 $\frac{1}{2}$ - 30
		La Belle Iron, pref.	106 $\frac{1}{2}$

Dividends

The Willys-Overland Company, regular quarterly, 1 $\frac{1}{2}$ per cent. on the common stock and in addition a 5 per cent. stock dividend, both payable May 1.

The Dominion Steel Corporation, regular quarterly, 1 $\frac{1}{2}$ per cent. on the preferred stock, payable May 1.

The American Rolling Mill Company, regular quarterly, 2 per cent. on the common stock and 1 $\frac{1}{2}$ per cent. on the preferred stock, both payable April 15.

The J. G. Brill Company, regular quarterly, 1 per cent. on the preferred stock, payable May 1.

The Taylor-Wharton Iron & Steel Company, regular quarterly, 1 $\frac{1}{2}$ per cent. on the preferred stock, payable April 24.

German Control of French Industries

The extent to which Germany has gained control of French and Belgian steel industries by conquest was indicated in a brief abstract of Dr. Emil Schrödter's recent investigations, published in *The Iron Age*, March 18, 1915. A further statement by him appears in *Stahl und Eisen* in regard to the industrial situation

Dr. Schrödter states that it will be seen from the horsepower data that 60.5 per cent. of the output of mines and quarries and 54.1 per cent. of the iron, steel and metal output depend on the war zone. In his former report he showed that the German control of coal was 68.8 per cent. of the total; of coke, 78.3 per cent.; of iron ore, 90 per cent.; of pig iron, 85.7 per cent. and of steel ingots 76 per cent. If, according to these figures, there remains to France 30 per cent. of the coal mining industry the actual production figures are far from reaching this percentage; as information shows that the daily production of coal in France does not exceed 20,000 tons—15 per cent. of the normal.

In all the industries referred to Dr. Schrödter concludes that over 40 per cent. of the aggregate industrial activity of France is under German control so far as concerns steam power.

German Steel Works Union's Business

The German Steel Works Union's statement, issued after its regular meeting on March 25, 1915, gives the following general review of the condition of the German steel trade:

In semi-finished materials the domestic output has increased due to greater activity among consumers. Sales to neutral countries are also larger than last month. In structural steel supplementary orders from the Prussian state railroads for rail fastenings have been allotted to the works. Additional orders for rails and sleepers will be given out in April. Export business in heavy rails is quiet, as the orders for neutral countries have been filled. Tramway rail business is quiet, but in mine rails an improvement has taken place in February and March over January, due partly to army contracts. In shapes the revival in domestic demand continues. Many private building orders are not looked for, but the erection of public and municipal buildings is being carried on freely so far as is possible with existing labor conditions, etc. Structural works and car builders are well occupied, so that an advance in the sales of shapes may be expected. Orders for future delivery from neutral countries have increased.

The Chicago Council of the National Council for Industrial Safety, at its monthly meeting, on Tuesday, April 20, conducted a round table discussion on "Safety for the Small Manufacturer," and had for the principal address of the evening a talk by Dudley R. Kennedy, Youngstown Sheet & Tube Company, on "The Future of Safety Work." Motion pictures were shown illustrating safety devices on wood and metal working machines and the processes of watch making at the works of the Elgin Watch Company.

The Richardson-Phenix Company, Milwaukee, Wis., has purchased the patents, good-will and manufacturing rights of the Osborne NoKut valve and is now

In war zone	Number of steam boilers		In war zone	Horse power	
	In France	Per cent. of total		In France	Per cent. of total
3,135	8,542	36.7	321,160	530,412	60.5
3,555	9,160	38.8	317,723	587,365	54.1
3,263	28,834	11.3	26,717	187,549	14.2
5,521	15,633	35.3	107,901	230,526	46.8
1,164	6,542	17.8	43,463	139,600	31.1
4,812	11,630	40.4	373,589	544,182	68.7
364	2,036	17.9	25,187	100,939	24.9
766	2,639	29.0	17,195	46,535	35.4
414	2,393	17.3	117,661	567,538	20.7
2,281	13,791	16.5	35,112	218,048	16.1
270	1,932	14.0	6,372	80,371	7.9
25,545	103,132	24.8	1,391,986	3,235,115	43.0

of France in the war area. As a basis of comparison Dr. Schrödter has selected the number of steam boilers used in each industry in France together with the corresponding horsepower. From these have been computed the percentages which apply to the districts in German occupation. The accompanying table represents the results of his calculations.

carrying a complete line of the various size valves in stock. The company decided to manufacture the NoKut valve because it feels that the feature of using a protector to prevent wire-drawing and the cutting of the valve disc and seat places this valve in a class by itself. Literature describing the NoKut valve may be had by addressing the company.

OBITUARY

E. H. Mumford

Edgar Huidekoper Mumford, well known for his contributions to the foundry industry through his inventions in molding machines, died April 18 at his home at Plainfield, N. J., aged 53 years. Only about a month ago he reestablished the E. H. Mumford Company at Elizabeth, N. J., after 15 years spent elsewhere in the business. Incidentally this last move brought him to the identical spot where he joined Harris Tabor in the



E. H. MUMFORD

development of the first vibrator molding machines in 1895. Previous to the last move, he was vice-president and general manager of the Mumford Molding Machine Company, Chicago, and as stated in *The Iron Age* of March 18, the E. H. Mumford Company had acquired ownership in patents and applications of patents under which the Chicago company had been operating since 1909. Mr. Mumford was born at Groton, Mass., September 20, 1862, and was graduated from Harvard College in 1885 and from Massachusetts Institute of Technology in 1886. He was a member of the American Society of Mechanical Engineers and of the Engineers' and Machinery Clubs of New York. He leaves his widow, two sons and two daughters.

GEORGE W. PRENTISS, Holyoke, Mass., who died April 2, aged 85 years, was one of a group of able men to whom the importance of that city as a manufacturing center can be credited. He was born in Claremont, N. H., was educated in the local public schools and began his business career as clerk in a general store. He learned wire making at Worcester, Mass., in the Henry S. Washburn Wire Works. After three years he had become so expert that he was made manager of the Norway Iron Works at South Boston. In 1857 he removed to Holyoke and established himself in the wire business, beginning quite modestly. He had a partner and the firm name was Prentiss & Gray, but in about a year he bought out his partner's interest and was sole proprietor until 1871, when M. W. Prentiss, who had been his superintendent for 10 years, acquired an interest. The business thrived from its very begin-

ning. A few years ago it was incorporated under the name of George W. Prentiss & Co. Mr. Prentiss served as president of the Holyoke Savings Bank for a long period and was a director until his death. He was also at one time president of the Holyoke National Bank and for many years a director. He was one of the directors of the Deane Steam Pump Company, Holyoke, and a director of the Third National Bank, Springfield. For many years he was treasurer of the Holyoke & Westfield Railroad. He took an active interest in municipal affairs and from time to time held local offices. He leaves a son and a daughter. His son, William A. Prentiss, became a member of the firm in 1877.

CHARLES S. STEPHENS, for many years identified with the wrought-pipe trade, died April 13 at his home in Brooklyn, N. Y., aged 59 years. He was born in Brooklyn. His connection with the trade began when he entered the employment of the National Tube Company, McKeesport, Pa. Transferring his activities to the Riverside Iron Works, Wheeling, W. Va., he became largely instrumental in the introduction of steel pipe as a merchant commodity. After the absorption of the Riverside Iron Works by the National Tube Company he was made Eastern representative of the Wheeling Steel & Iron Company. This later connection continued until about four years ago when he became associated with Robert K. Story, 150 Nassau street, New York, under the firm name of Story & Stephens, acting as direct representatives for various manufacturers in the supply line. He thus became widely known to the trade of the country. Mr. Stephens was compelled to retire from active business two years ago, owing to failing health and was unable to recuperate. He leaves his widow.

JOHN M. SHERRARD, assistant to W. H. Schoen, president Kennedy-Stroh Corporation, Pittsburgh, died at his home in Easton, Pa., April 15. He was formerly secretary of the Stroh Steel Hardening Process Company, Pittsburgh, and prior to that time was for 18 years sales manager of the Taylor-Wharton Iron & Steel Company, High Bridge, N. J. He was a graduate of the Rensselaer Polytechnic Institute and a member of the American Society of Civil Engineers, American Society of Mechanical Engineers and American Institute of Mining Engineers.

SAMUEL J. WATSON, president Watson Machine Company, Paterson, N. J., died April 14, aged 65 years. He was graduated from Harvard University with the class of 1877 and was a member of the Metropolitan Museum of Art, the Harvard and Lotos clubs of this city, and the North Jersey Country Club. He was formerly secretary and treasurer of the Watson Machine Company, and on the death of his father, who founded the company, became president.

FREDERICK C. KEIGHLEY, for many years general superintendent of the coal and coke works of the Oliver & Snyder Steel Company near Uniontown, Pa., ended his life April 14, by shooting himself. He had been depressed by the closing of the First National Bank, of Uniontown, in which he was a large stockholder. He was born in Keathley, Yorkshire, Eng., May 5, 1885, and was taken by his parents to Youngstown, Ohio, where he received his early education.

MAJOR LUTHER STEDMAN BENT, former president of the Pennsylvania Steel Company, died at his home near Philadelphia, April 19, aged 86 years. He was born in Quincy, Mass., was educated as a civil engineer and served throughout the Civil War as major of volunteers. After the war he was employed by the Northern Pacific Railway, and in 1874 became connected with the Pennsylvania Steel Company. He retired as head of the steel company about ten years ago.

GEORGE O. ROBERTS, vice-president of the Standard Forgings Company, Chicago, was found dead from drowning at the Jackson Park beach April 17. It is surmised that a long series of illnesses among the members of his family had caused him to become despondent.

PERSONAL

John C. Jay, Jr., general manager of sales and recently elected vice-president of the Pennsylvania Steel Company and Maryland Steel Company, was tendered a dinner by the sales department of the companies on the night of April 16 at the University Club, New York. Every domestic sales office of the companies with the exception of San Francisco was represented. Charles S. Clark, the dean of the department, presided. Richard Peters, formerly Philadelphia sales manager, and now retired from active business, was a guest. Representatives present from the various offices were the following: Philadelphia—F. H. Tackaberry, Robert Gross, T. C. Voorhees, F. A. Lowery. Boston—C. S. Clark, H. G. Barbee, J. A. Fitzpatrick. Chicago—R. E. Belknap, F. H. Ogden, J. F. Hennessy. Steelton—N. E. Salsich, W. C. Wright, H. L. Rittenhouse, R. L. Gillespie. Pittsburgh—E. E. Goodwillie. Baltimore—J. A. Davis. New York—R. W. Gillespie, R. W. Read, T. Blagden, Jr., E. DeWitt, G. F. Simson, W. K. Smith.

Leo G. Smith has resigned as works manager of the open-hearth and crucible foundries of the Prime Steel Company, Milwaukee, the change taking effect May 15.

Merrill G. Baker, who March 1 became assistant to J. Leonard Repleglo, vice-president and general manager of sales of the American Vanadium Company, Pittsburgh, with headquarters in New York, has been given the title of assistant general manager of sales.

Charles S. Bygate, formerly with the Whitney-Kemmerer Company, and George W. Theiss have formed a partnership under the name of the Theiss-Bygate Company to engage in the business of buying and selling coke, with offices in the Oliver Building, Pittsburgh.

Alexander Taylor, of Toronto, Canada, has been promoted from assistant secretary to secretary of the Lake Superior Corporation, the Algoma Steel Corporation and subsidiary companies. He succeeds Thomas Gibson, who recently was made president of the Lake Superior Corporation. Mr. Taylor also became a director.

Announcement is made of the consolidation of the practices of John S. Griggs, Jr., electrical and mechanical engineer, and David Moffat Myers, mechanical engineer, under the style of Griggs & Myers, to conduct a business as consulting engineers, with offices at 110 West Forty-first street, New York. Mr. Griggs was for 12 years senior partner of the consulting firm of Griggs & Holbrook, and has been in practice as a consulting engineer in New York for 20 years. Mr. Myers, formerly mechanical engineer for the United States Leather Company, in 1906 started a private consulting practice. He has specialized on the efficient operation and design of industrial plants, with particular reference to steam and fuel economy. Among Mr. Myers's publications is the book on "Preventing Losses in Factory Power Plants," which has had wide circulation. The new firm is in a position to handle mechanical and electrical propositions with increased efficiency.

Edwin S. Jarrett, formerly vice-president of the Foundation Company, and Ralph H. Chambers, formerly chief engineer and general manager of the same company, have organized the Jarrett-Chambers Company, Inc., to conduct a contracting business, with offices at 30 East Forty-second street, New York.

W. M. Swift Miller, formerly advertising manager of the Allis-Chalmers Company, since then connected with the Industrial Controller Company, has become associated with the T. S. Wheel & Mfg. Company, Milwaukee, Wis., as president and general manager, manufacturing a steel resilient wheel for automobiles and trucks.

Jacob Justesen, superintendent of transportation of the Wausau Street Railroad Company, Wausau, Wis., has resigned to become associated with G. M. Winne,

Chicago, Ill., in the practice of engineering and general contracting. The new firm will be known as Winne & Justesen and headquarters will be in Wausau.

Frederick Patterson, son of John H. Patterson, president National Cash Register Company, Dayton, Ohio, has been appointed export manager of that company.

R. E. Ellis, formerly associated with the Stainle Machine Company, Madison, Wis., has formed the R. E. Ellis Engineering Company with offices in the First National Bank Building, Chicago, in which connection he will represent the Bury Compressor Company and the Standard Electric Tool Company in that market.

Clarence Boyle, Jr., formerly district sales manager of the Taylor-Wharton Iron & Steel Company, Connell Building, Scranton, Pa., has become associated with Clarence Boyle, Inc., wholesale lumber 1211 Lumber Exchange Building, Chicago, effective May 1.

Maximilian Toch will address the Society of Chemical Industry, New York Section, at Rumford Hall, 50 East Forty-first street, New York, Friday evening, April 23, on "Paints as Protective Agents Against Corrosion."

Dr. Carl Hering, consulting engineer, Philadelphia, has been elected a fellow of the Association for the Advancement of Science.

Bradley Stoughton, secretary of the American Institute of Mining Engineers, New York, has been made one of the jurors of awards on mines and metallurgy at the Panama-Pacific International Exposition. He will leave for San Francisco the last of this month.

Samuel Miles Hastings, vice-president and treasurer of the Moneyweight Scale Company, Chicago, has been elected president of the Illinois Manufacturers' Association, succeeding Edward N. Hurley, resigned. William Butterworth, president of Deere & Co., Moline, Ill., was chosen first vice-president and Charles A. Plamondon, president of the A. Plamondon Mfg. Company, Chicago, second vice-president.

George B. Thomas has resigned as resident manager of the Cleveland plant of the United States Cast Iron Pipe & Foundry Company, which position he has held for a number of years.

Steel Foundry Operations in Chester

Steel foundries in the Chester, Pa., district, while doing better than in November and December, are far from a normal operation. Of the eight foundries—six open-hearth, one converter and one crucible—one open-hearth and the crucible foundry are still closed. The working time of the others depends on the character of their output. The plants specializing in Government work are fairly busy on contracts for the new dreadnaughts and other vessels, and are averaging 50 to 60 per cent. of capacity. Other plants depending more on locomotive and general jobbing are less busy while those doing all grades of work are operating only fairly well. The average output of the district is not over 40 to 50 per cent. of normal.

The Sterling Grinding Wheel Company, Tiffin, Ohio, is taking an additional store in Chicago, thus doubling the size of the old store. The L. Best Company, located for many years at 45 Vesey street, New York, has decided to move to 75 Barclay street, where a much larger and better store and better facilities for displaying Sterling grinding wheels will be secured.

The Anderson Ratchet Wrench Company, Union Stock Yards, Chicago, has installed equipment in the form of special machinery, dies and tools for the manufacture of a ratchet wrench of its own design. Wrenches in the 8-in. size can now be supplied, and 6 and 10-in. sizes are to follow in about a month.

The Gray Tractor Mfg. Company has moved its shop and offices to 1030 Marshall Street, Northeast, Minneapolis, Minn. The new quarters are larger and better adapted to the company's needs, placing it in a position to handle its increasing business.

Pittsburgh and Nearby Districts

The meeting of the American Institute of Electrical Engineers held in Pittsburgh on Thursday and Friday of last week was well attended. The programme given in last week's issue of *The Iron Age* was adhered to. On Thursday evening an informal beefsteak dinner was held at the Fort Pitt Hotel, at which an address was made by Dr. John A. Brashear, on "Reminiscences of Scientific Discoveries." Many of the visiting members took advantage of the opportunity to inspect the electrical equipment of large iron and steel plants in the Pittsburgh district.

Early in May the Ohio Iron & Steel Company will start its Mary furnace at Lowellville, Ohio, which has been idle more than seven months. The furnace has been completely overhauled and much new equipment added, including 3000 hp. Rust boilers, 80-ton ladle cars furnished by the William B. Pollock Company, Youngstown, a new cinder runway, etc. More than \$100,000 was spent in rebuilding the furnace and in new equipment. The ladles were added to be used in furnishing molten iron to the Youngstown Iron & Steel Company, which is building an open-hearth steel plant near by. The stack will blow in on basic iron, and is expected to make from 400 to 450 tons per day.

The Lockhart Iron & Steel Company, McKees Rocks, Pittsburgh, has started its puddling plant containing 31 single puddling furnaces, and will run it five days per week. The company has enough muck bar on hand to supply its needs for nearly a year, but put the plant in operation to give the men some work.

The annual meeting of the Amalgamated Association of Iron, Steel and Tin Workers will be held this year in Louisville, Ky., starting Tuesday, May 4. The association will probably receive this year a large accession in membership from puddlers that formerly belonged to the Sons of Vulcan, the latter organization having practically dissolved. The mills controlled by the association, which are nearly all in the Central West, are, however, fewer in number than ever before in the history of the organization. They embrace some sheet and tin-plate mills in the Wheeling and Youngstown districts. None of the sheet and tin-plate mills in the Pittsburgh district sign the association scale, but several concerns operating puddling furnaces in that city making bar iron sign the scale.

The H. Koppers Company, Pittsburgh, announces a second order from the Cambria Steel Company, Johnstown, Pa., for 42 by-product coke ovens, making 84 in all. Other plants now under construction by this company include 56 ovens for the Laclede Gas Light Company, Laclede, Ill.; 212 ovens for the Lehigh Coke Company, Bethlehem, Pa., and 75 ovens for the Republic Iron & Steel Company, Youngstown, Ohio, besides the benzol refining plant for the 86 ovens of the Inland Steel Company, Indiana Harbor, Ind.

The Youngstown Iron & Steel Company has practically finished awarding contracts for the equipment for its new steel plant. The Morgan Engineering Company will furnish two 25-ton mill cranes, one 60-ton hot metal crane and one 5-ton low type soaking pit crane, all equipped with General Electric motors. A monorail crane will be supplied by the Northern Engineering Works and three spout cranes by the Whiting Foundry & Equipment Company. One 150-ton 56-ft. track scale and one 100-ton 26-ft. standard gauge hot metal scale will be furnished by Fairbanks, Morse & Co., all soaking pit castings by the William Tod Company, structural steel binding for the soaking pit furnaces by the McClintic-Marshall Company, door operating mechanism by the Youngstown Foundry & Machine Company, all gas piping by the William B. Pollock Company, and two soaking pit furnace stacks by the Meehan Boiler & Construction Company. In March the Youngstown Iron & Steel Company turned out 5254 net tons of black sheets.

The Union Signal Construction Company, Pittsburgh, has been formed with a nominal capital of \$10,000,000 to manufacture and deal in railroad supplies. It is an identified interest of the Union Switch

& Signal Company, and will do construction work only. The incorporators are W. D. Uptegraff, T. W. Siemon and T. S. Grubbs, all of whom are officers of the Union Switch & Signal Company.

The Buckeye Aluminum Company, Wooster, Ohio, is erecting a new building, 44 x 44 ft., the first floor to be used as a power plant and the second floor for factory purposes. A gas engine and 400 hp. generator will be installed.

The Pittsburgh Engineering Company, Pittsburgh, recently formed to conduct business in consulting engineering, has changed its name to the Steel City Engineering Company, with offices in the House Building. It was found that another concern was already known as the Pittsburgh Engineering Company, although in another line of business.

The Riter-Conley Mfg. Company, Pittsburgh, with works at Leetsdale, Pa., has received orders within the past two or three months amounting to nearly \$3,000,000. In March it shipped over 10,000 tons of fabricated material and took in over 14,000 tons of plates, shapes and other material from Pittsburgh mills. A recent bridge order, received from the Indianapolis Union Railway, covers the furnishing of about 8100 tons of material for track elevation in Indianapolis. A specialty of the company is the manufacture of oil storage tanks. Refinery and tankage work recently booked for the Texas Company includes 6500 tons of plate work to be erected at its various refinery plants. Orders for galvanized transmission towers for power and light companies call for the delivery of nearly 75 miles of towers to be erected in eastern Pennsylvania, North and South Carolina and along the Ohio River from Pittsburgh to Beaver, Pa. A 4,000,000 cu. ft. gas holder is now under contract for the Cambridge Gas Light Company, Cambridge, Mass. A contract is practically concluded with the United States Reclamation Service for furnishing material for the rolling crest at the Grand River diversion dam of the Grand Valley project in Colorado, involving about 300 tons of structural and plate work. Other orders included the structural steel required for an extension to the shops of the Hockensmith Wheel & Mine Car Company, Penn Station, Pa., and the American Vanadium Company, Bridgeville, Pa.

G. D. Breck, district manager of the Babcock & Wilcox Company of New York City, with headquarters in the Farmers Bank Building, Pittsburgh, recently took what is said to be the largest single order for high pressure water-tube boilers ever placed. This order was given by Corrigan, McKinney & Co., Cleveland, Ohio, and calls for 28 850-hp. Stirling and B. & W. boilers of 250-lb. pressure, or a total of 23,800 hp. The B. & W. boilers will be erected to utilize waste heat for the open-hearth furnaces, while the Stirling boilers will be built to furnish steam for the blast furnaces, of which there will ultimately be seven, and also for the new open-hearth steel plant. The Pittsburgh office of the B. & W. Company has also taken an order for two 200-hp. water-tube boilers for the new open-hearth steel plant of the Youngstown Iron & Steel Company.

The LaBelle Iron Works, Steubenville, Ohio, has made a reduction in wages of its sheet mill hands of 11 per cent., corresponding to the wage reduction recently made in the Amalgamated Association scale. The company operates its sheet mills non-union, not signing union wage scales of any kind.

The Clinton Iron & Steel Company, Pittsburgh, whose blast furnace has been idle since last September, expects to put it in blast in May on foundry iron. It has a capacity of about 350 tons per day.

Plans are being completed for an extensive addition to the plant of the Erie Mfg. & Supply Company, Erie, Pa., manufacturer of machinery supplies.

The Gibb Instrument Company, Highland Building, Pittsburgh, Pa., has been incorporated with a capital stock of \$10,000 by W. H. Gibb, Edgewood Park, Pa.; J. R. Brueckner, Wilkinsburg, Pa., and T. W. Clark, Pittsburgh, to manufacture pyrometers, potentiometers and pyrochronographs, thermometers, pressure gauges, and scientific apparatus. It is taking up an existing plant. W. H. Gibb is president.

Heavy Buying of Cars for the Pennsylvania Railroad

The Pennsylvania Railroad announced at Philadelphia on Friday, April 16, that it would at once go into the market for \$20,000,000 worth of equipment and of material for cars and locomotives which it will build in its own shops. The company's present programme includes the construction of 144 new locomotives, 76 of the standard type and 68 shifting locomotives; 146 all-steel passenger cars, and 10,000 freight cars. The locomotives will be built in the Altoona shops. Bids will be asked for 8150 of the freight cars, which the company plans to have built by outside companies, and on materials for some 2000 freight cars to be built at the Altoona shops.

A Pittsburgh dispatch of April 19 says that the Pennsylvania Company, operating lines west of Pittsburgh, has sent out inquiries covering materials for 6400 freight cars, 50 locomotives and 35 all-steel passenger cars. It was added that these were not included in the inquiries for the Pennsylvania Railroad referred to in the announcement from Philadelphia. It was stated that the inquiries for the Pennsylvania Lines West represent \$10,000,000, but the amount that can be figured on the basis of to-day's values is considerably less than that for the equipment named, as it is also in the case of the purchases to be made from Philadelphia.

American Sheet & Tin Plate Wages Reduced

The American Sheet & Tin Plate Company, Pittsburgh, has posted notices at its sheet and tin mills of a reduction in wages to be effective from April 16. The new wage rates are irregular, but involve about the same reductions in sheet and tin mill labor as is called for in the wage scale of the Amalgamated Association in the union sheet and tin mills, which went into effect on Monday, March 22. The average reductions made by the American Sheet & Tin Plate Company are 11.2 per cent. in the sheet mills and 6 per cent. in the tin mills. Its scales of wages, like those of the Amalgamated Association, are based on a sliding scale, with 1.90c. on No. 28 black sheets as the minimum and \$3.20 on 14 x 20 coke plates as the minimum for the tin plate scale. Sheet mill hands employed by the American Sheet & Tin Plate Company will be advanced 1.8 per cent. for every 5-cent advance per 100 lb. in the average selling price of No. 28 black sheets, and men employed in the tin mills will be advanced 1 per cent. for every 5-cent advance per 100 lb. in the average selling price of tin plate until \$3.50 per base box is reached, which is maximum of the scale. These advances are slightly above, and are said to be less complicated than those provided in the sliding scales of the Amalgamated Association. The American Sheet & Tin Plate Company did not make any horizontal cuts, but distributed its reductions in wages among all the men as equitably as possible, the rollers suffering the heaviest reduction. Three or four mills of the American Sheet & Tin Plate Company, in which prevails what is known as the Cleveland wage scale, will not be affected by the wage cut.

The Bethlehem Steel Company has placed an order with the Wellman-Seaver-Morgan Company, Cleveland, Ohio, for a Hulett ore unloader equipped with a 15-ton bucket, which will be erected on the Lehigh Valley Railroad docks at Constable Hook, near Bayonne, N. J. The machine will be used for unloading Chilean ore direct from the boats to cars and therefore a storage bridge for rehandling will not be required. This will be the first ore unloader of the Hulett type to be erected on the seaboard. The Bethlehem Steel Company has had the erection of this plant under consideration for a number of months.

The tungsten ore output of the United States for 1914 is estimated by the United States Geological Survey to be about 990 tons carrying 60 per cent. tungsten trioxide (WO_3). This is the smallest since 1908, when only 671 tons was mined. The 1913 production was 1537 tons.

The Federal Trade Commission's Position

WASHINGTON, D. C., April 20, 1915.—A conference between the Federal Trade Commission and the trade commission committee of the Chamber of Commerce of the United States, held April 17, developed two important facts: 1. That the commission is not only willing but anxious to receive the co-operation of trade bodies of recognized standing. 2. That the Chamber of Commerce of the United States, as the result of its reorganization on a broad basis and the selection of men of national reputation to represent it on its leading committees, is now in position to work effectively in the interest of the commerce of the whole country.

Notwithstanding the general character of the conference, a brief discussion occurred of two subjects of high importance to American manufacturers, namely, the fixing of resale prices by producers of goods and the legalizing of combinations for the development of foreign trade. The commission has taken over an investigation, begun some months ago and now nearly completed, on the subject of price maintenance. It can be stated that the commission has an open mind with reference to the important question of combinations for the development of foreign trade and will base such opinion as it may formulate upon an investigation about to be undertaken. This inquiry will be prosecuted with a view to determining, first, whether such combinations are desirable and, second, as to whether specific legislation is necessary to legalize them. On the strictly legal phase of the subject certain members of the commission are convinced that such comprehensive combinations as would be really effective in the foreign trade are contrary to the letter, if not the spirit, of the Sherman act and the laws amendatory thereof.

An important feature of the commission's inquiry will be a searching investigation into the methods employed by the great European cartels which enjoy governmental support in their combinations to exploit foreign trade. The tariff discussions in Congress are filled with contradictory statements concerning the organization, purposes and results of these semi-official combinations and nothing but a carefully prosecuted special inquiry will determine many disputed points. Such an investigation the commission is about to undertake and the outcome will be awaited with the liveliest interest.

W. L. C.

Lackawanna Steel Company's Quarterly Report

A report has been issued by the Lackawanna Steel Company, covering all subsidiary companies, giving earnings in the first quarter of this year, as compared with the corresponding quarter of 1914. The showing made is far from satisfactory, the result of the three months' business being a deficit of \$565,758.77, against a deficit for the corresponding quarter in 1914 of \$445,207.09. The statement is as follows:

	1915	1914
Income from operating, after deducting all expenses incident thereto, including ordinary repairs and maintenance of plants and interest on fixed charges of subsidiaries.....	\$27,431.72	\$154,995.63
Proportion of earnings on investments in companies not controlled, and other annual income	69,477.92	81,051.35
Total	\$96,909.64	\$236,046.98
Deduct interest on Lackawanna Steel Co. bonds and notes...	425,783.34	437,424.98
Balance	-\$328,873.70	-\$201,378.00
Less charges and appropriations: Sinking funds on bonds and exhaustion of minerals.....	32,505.64	36,860.33
Depreciation and accruing renewals	204,379.43	206,968.76
Profit	-\$565,758.77	-\$445,207.09

Unfilled orders on March 31, 1915, were 229,910 gross tons, against 191,828 tons March 31, 1914. Booked from April 1 to 14, 67,249 tons. The production of the benzol plant has been sold for the remainder of this year.

Machinery Markets and News of the Works

WAR BUYING PERSISTENT

Inquiries Promise Railroad Buying

Question of Deliveries of Certain Types of Tools Has Reached a Serious Stage—Pacific Shipments Heavy

The demand for those machines which are most used in the manufacture of munitions of war has taken another spurt and fresh lots of tools have been purchased. Some of them cannot be delivered until August or later, indicating the sold-up condition of the builders. At least five railroad lists are out and there is promise of railroad buying before long, though difficulty in obtaining early deliveries may delay some transactions. The Bethlehem Steel Company has ordered over 250 machines through New York offices. In New England shops are being further speeded up wherever that is possible and production is receiving much study. From Chicago it is reported that the railroads may not place early orders, except where they can get satisfactory deliveries. Some tool builders are protecting the domestic trade. In Milwaukee there is continued improvement, and plant extensions are more common. The automobile industry is a good purchaser in Cleveland and in that city there has been a notable demand for forging machines. Deliveries on lathes are set three months ahead in Cincinnati; domestic business continues to improve, and the railroads are expected to come into the market. Many firms in the Central West have war business on which they have received part cash payment. A general betterment is shown by the Central South. It St. Louis business progress is extremely slow. The Puget Sound exports for three and a half months were at a rate of \$100,000,000 a year, indicating 100 per cent. increase over 1914. San Francisco is improving but slowly and trade is not yet satisfactory.

New York

NEW YORK, April 21, 1915.

Additional purchasing by the American Locomotive Company and the placing of orders for a large number of machine tools by the Bethlehem Steel Company occurred in the week. In both cases the machines bought are to be used in the manufacture of munitions of war. The Bethlehem Steel Company bought over 250 tools, including engine lathes, turret lathes, semi-automatic lathes, horizontal turret machines, drill presses, cutting off saws, etc. The business was well distributed and some of the deliveries are to run to August. The American Locomotive Company bought screw machines to be used in the manufacture of shrapnel fuse timers.

It is understood that both the Bethlehem Steel Company and the Canadian Car & Foundry Company are in a position to sub-let shrapnel work. More firms are now mentioned as engaged in shrapnel or explosive shell work, or seeking it, than at any time heretofore.

Railroad buying of machine tools is promising. The Lehigh & New England Railroad will place orders soon for its new repair shop at Penn Argyle, Pa. The programme of

car and locomotive construction announced by the Pennsylvania Railroad will make the shops of that company busy in a short time. It already has issued inquiries for materials and machinery needs should develop.

In addition to the war business there has been a good run of miscellaneous orders. A New York office representing a Western manufacturer had the biggest week in its history last week. The volume of business done was equal to that of some entire years in the past. The need of placing orders for tools needed, or soon to be needed, is more urgent than ever because of the constantly changing deliveries. In some cases waiting two or three days meant that orders could not be accepted for delivery in the required time. While the big demand is for shrapnel and shell-making machines, other types of tools are selling better than they were. Shapers and planers are still easy to get.

Charles L. Seabury & Co., Morris Heights, New York, recently issued an inquiry for fifteen small turret lathes. The Curtis Aeroplane Company, Buffalo, has been a good buyer of late.

The General Electric Company is expected to enter the market for a large number of tools in the near future. The company is making shrapnel, but has been utilizing its present equipment.

The American Locomotive Company has secured contract for 2,500,000 shells for the Government of one of the allies in the European war, amounting to over \$30,000,000. The larger proportion of the order will be filled by the Brooks plant of the company at Dunkirk, N. Y., where 4000 shells per day will be turned out. The Montreal plant of the company will manufacture 1000 shells per day. A large amount of new machinery, including lathes, boring machines, etc., will be installed and the plants will be operated on double time.

The Stoney Foundry Corporation, North Tonawanda, N. Y., has been incorporated with a capital stock of \$50,000 by Edwin C. Andrews, Buffalo; John T., and Raymond E. Stoney, Cleveland, Ohio, and Albert M. Everhart, North Tonawanda, to manufacture gray-iron automobile castings. It has leased a part of the foundry of the Niagara Radiator & Boiler Company at North Tonawanda, and plans to start business about May 1. The equipment has practically all been purchased. E. C. Andrews is president, and A. M. Everhart is plant manager.

The J. B. Carr Company, manufacturer of chain, etc., Troy, N. Y., has sold the site of its present plant to the Troy Gas Company, and will move and re-locate the buildings and equipment along the tracks of the Delaware & Hudson Railroad in West Troy or Watervliet, enlarging the area and improving the buildings and equipment. The change will probably result in the doubling of the present capacity. J. H. Woodhouse is president.

The Meyer Scale Company, 41 Elizabeth avenue, Newark, N. J., suffered recently a loss of about \$12,000 by fire, which destroyed the contents of its pattern room. Beyond considerable inconvenience the company anticipates no trouble in getting out its orders.

The Sugar Factories Construction & Equipment Corporation, 82 Beaver street, New York, has increased its capital stock from \$7200 to \$100,000, to take care of the business it now has on hand. H. V. Bradford is president.

George F. Lufbery, Jr., Elizabeth, N. J., has purchased 9 1/3 acres of land, and will erect a plant for the manufacture of chemicals for the rubber trade.

The Auto Specialty Equipment Company, 583 Jackson avenue, Brooklyn, N. Y., plans to erect a five-story service plant for automobiles, 50 x 96 ft. John M. Baker, 9 Jackson avenue, is the architect.

The Curtis Aeroplane Company, Buffalo, has let contract to the Ferguson Steel & Iron Company for the second building, 100 x 300 ft., at its new plant at Churchill street and the New York Central Railroad, making the total length of the plant 600 ft. The buildings are steel frame with steel truss roof and will cost \$75,000.

The Buffalo Forge Company, Broadway and Mortimer street, Buffalo, N. Y., of which William F. Wendt is presi-

dent, has plans completed for a five-story addition, 125 x 200 ft., to be made to its plant next month.

The Gurney Ball Bearing Company, Jamestown, N. Y., is having plans prepared for a new manufacturing plant which it will build this summer.

Bids are being taken for a three-story addition to the cold-storage plant to be erected on School street, Yonkers, N. Y., by H. Steinmetz, 44 School street.

The Empire Seating Company, Rochester, N. Y., has been incorporated with a capital stock of \$25,000 to manufacture school furniture and supplies. F. E. Tiffany, 805 Culver road; L. C. Benton, 309 Adams street, and F. A. Holmes, 344 Carthage street, Rochester, are the incorporators.

The Curtis Aeroplane Company, Hammondsport, N. Y., has started work upon a two-story and basement machine shop, 41 x 130 ft.

The Schoellkopf, Hartford & Hanna Company, Buffalo, is completing plans for an extensive addition to its plant at Abbott road, the Buffalo River and the Lake Shore Railroad, for the manufacture of aniline dyes.

Harriman, N. Y., is having plans for a waterworks system prepared by Knight & Bush, engineers, Monroe, N. Y., at an estimated cost of \$60,000.

The C. H. Stewart Company, Newark, N. Y., manufacturer of perfumes and extracts, has let general contract for erection of a two-story and basement factory, 60 x 100 ft., and wing, 20 x 30 ft.

Bloomer Brothers, Newark, N. Y., are having plans prepared for an addition to their factory which will be erected this spring.

H. G. Hammeth, 486 Eighth street, Troy, N. Y., will have plans completed for an addition, 50 x 65 ft., to his machine shop, to be erected at once.

The General Electric Company, Schenectady, N. Y., is stated to be in the market for 42 lathes.

New England

BOSTON, MASS., April 20, 1915.

The machine shops of New England are getting busier all the time; that is, those that have not already reached their limit. Mechanics are now no longer without work. The trade is wondering where the machinery is to come from to produce the rumored large additional projectile business. The market for turning and grinding machines is pretty well depleted. Opportunity, however, exists for the building of special equipment. The engineering brains of the industry have, in fact, been turned in a large way to these types of machinery. Some of the large works are busier on what might be termed job orders, than on their standard lines, which do not fit in with the requirements of arsenal or ammunition work. Those who wish to buy projectile machinery may therefore be more fortunate in seeking it than some people believe. Mixed up in this tremendous demand for machines for the manufacture of war materials are great orders for arsenal equipment, for the making of small arms, which probably would have been placed if no European war was in progress. Of such is the machinery for a Chinese arsenal, the contract for which was placed months before the beginning of the present hostilities, the Pratt & Whitney Company, Hartford, Conn., making no secret of the order. Other similar contracts have been placed in the United States recently by governments which will probably remain neutral in the present conflict.

Regardless of the reasons for the new construction, the building contracts now being awarded for the housing of equipment for making war material, and perhaps the material itself, are tremendous. In Bridgeport, Conn., the board of building commissioners has granted permits to the Remington-Union Metallic Cartridge Company—known locally as the Bridgeport Arms Company—for the erection of six buildings, each 62 x 275 ft., with an ell 50 x 78 ft., all five stories, of brick, concrete and steel. A power house will be 90 x 121 ft., one story. The estimated cost of this plant is \$1,060,000. The latest announcement of additions to the great works of the Winchester Repeating Arms Company, New Haven, Conn., is of two buildings, one 22 x 80 ft., two stories, for a gas plant; the other, 53 x 208 ft., one story, for gas storage.

The Hendey Machine Company, Torrington, Conn., has plans completed for a core room building, 60 x 90 ft., one story, and has tentative plans for an additional foundry building.

The Gardner General Foundry Company, Gardner, Mass., is planning to erect an addition.

The Ramsdell Specialty Company, Worcester, Mass., manufacturer of screw machine products, has contracted for a factory to replace the plant destroyed by fire recently.

The American Writing Paper Company has awarded the

contract for two additions to its plant at Unionville, Conn., to be used respectively for a power house and a bleachery.

Announcement is made in Keene, N. H., that the A. E. Martell Company, Boston, manufacturer of loose-leaf and manifold books, will erect a large new plant in the New Hampshire city.

The Hartford Machine Screw Company, Hartford, Conn., subsidiary of the Standard Screw Company, will erect a building 50 x 206 ft., five stories, to occupy the site of the present office structure and will be devoted to office and manufacturing purposes.

The Coe Brass Company, Torrington, Conn., branch of the American Brass Company, has awarded the contract for two buildings, one for storage, 125 x 200 ft., with sawtooth roof, the other for coal storage, 50 x 194 ft.

The MacArthur Concrete Pile & Foundation Company, 11 Pine street, New York City, has been awarded the contract for the foundation of a screening plant and water tower for the Lynn Gas & Electric Company, Lynn, Mass.

Philadelphia

PHILADELPHIA, PA., April 20, 1915.

The G. A. Gray Company, Cincinnati, Ohio, builder of the well known line of Gray planing machines, has appointed as its selling agent in the Philadelphia district the Swind Machinery Company, Bourse Building, Philadelphia.

The Standard Chain Company, York, Pa., has recently started excavation on very extensive additions to its electric welding department. Some 6½ acres of ground have been acquired and in anticipation of good business the following additions will be built: A forming room, 68 x 420 ft., which will be used as a welding, finishing and shipping building, and stockroom, 176 x 333 ft. In addition to these buildings there will be a two-story office building, with basement, 50 x 64 ft. In order to accommodate the company, so that its buildings might be contiguous, the city of York has opened new streets. Additional sidings will be erected, and when complete there will be about one-third mile of railroad sidings on the property.

The new factory being erected for the Hess-Bright Mfg. Company, Front street and Erie avenue, Philadelphia, by the Harrison C. Rea Company, will cost about \$13,000.

F. Brecht's Sons, 109 North Orianna street, Philadelphia, manufacturers of cigar boxes, are having plans prepared for a two-story and basement addition of reinforced concrete and brick, 42 x 50 ft. Arthur O. Forster, Roxborough, is the architect and engineer.

The carriage factory and blacksmith shop of L. R. Speck, Welsh Run, Green Castle, Pa., was entirely destroyed by fire on April 7, with a loss of several thousand dollars. Plans for rebuilding have not yet been formulated.

Lancaster, Pa., has voted \$145,000 for waterworks improvements, etc.

The Agasote Millboard Company, Trenton, N. J., is having plans prepared by John G. Brown, Witherspoon Building, Philadelphia, for additions to its plant, 92 x 100, and 100 x 336 ft. Harold Harvey is assistant manager.

Camden, N. J., has authorized an issue of \$50,000 of bonds for improving and enlarging its waterworks.

Baltimore

BALTIMORE, MD., April 19, 1915.

With a capital stock of \$300,000, Isaac A. Sheppard & Co., of Baltimore and Philadelphia, the well-known stove manufacturers who went into the hands of receivers in September, 1914, will be reorganized. The receiver is to be discharged in the near future. The stock of the reorganized concern is to be pooled for a period of five years. Charles C. Homer, Jr., president of the Second National Bank, Baltimore, who represented the Baltimore creditors, will be a director and also one of the voting trustees for the stock. The other directors named are Franklin L. Sheppard, John R. McKnight, Howard R. Sheppard, Paul Clayton, the receiver, William Post, John K. Keen and Harry Brockelhurst. The officers will be: President, Franklin L. Sheppard; vice-president and general manager, John R. McKnight; secretary and treasurer, Howard R. Sheppard. The receiver is to transfer the assets to the new corporation known as the Isaac A. Sheppard Company. For a period of five years the company will be controlled by the creditors, until the liabilities of the old concern are met. The reorganized company will employ about 400 men in its foundry in Baltimore and its stores in New York and Philadelphia.

Specifications are being prepared by the water board for an electrically-driven centrifugal pump for the eastern pump-

ing station, Baltimore. The new pump is to have a capacity of 25,000,000 gal. a day.

The Virginia Products Corporation, refiner of oils, has purchased nearly two acres of ground in Canton, Md., from the Canton Company, now occupied by the buildings of the oil concern. The corporation leased the tract some time ago for the purpose of testing the advisability of locating near Baltimore.

C. Craig Fears has been appointed in the United States District Court receiver for the Monitor Heating Company, 212 West Fayette street, Baltimore.

The American Oil Company, Clarkson street and the Baltimore & Ohio Railroad, Baltimore, will build a one-story addition, 32 x 68 ft., to cost about \$1000.

J. Frank Supplee, New York, in a letter to Mayor James H. Preston, states that the Victor Typewriter Company, New York, is considering locating in or near Baltimore.

C. A. Kelso has asked permission of the city of Baltimore to occupy the property at 1816 Aliceanna street with a blacksmith shop.

The premises, 421 and 423 North Front street, Baltimore, are to be used by Rogers & Abels as an automobile shop.

Chicago

CHICAGO, ILL., April 19, 1915.

With bids not yet submitted on a part of the railroad machine-tool inquiry now in the market, there appears little likelihood of a very prompt placing of this business. It is a fair assumption that final decision as to the type of equipment to be purchased will be influenced by what machines are available from stock, inasmuch as leading manufacturers of standard tools are in no position to offer early deliveries. Some machine-tool makers have announced that they will accept no more orders for export, preferring to conserve their facilities for accommodating regular domestic trade. Miscellaneous inquiry last week was somewhat lighter.

The tools listed for purchase by the Missouri, Oklahoma & Gulf Railway, of which H. P. Abbey, Muskogee, Okla., is purchasing agent, are as follows: One 2½ x 26-in. combination turret lathe, motor driven; one 16-in. toolroom lathe, belt driven; one 16-in. brass lathe, belt driven; one 16-in. portable lathe, motor driven; one 60-in. planing machine; one toolroom grinder; one link grinder; one 48-in. carwheel boring mill, belt-driven; one 42-in. vertical boring and turning mill, belt-driven; one portable cylinder boring machine; one 14-in. sensitive drill, belt-driven; one 36-in. vertical drill, belt-driven; one hydraulic wheel press, belt-driven; one portable bushing press; one universal milling machine, belt-driven; one safety emery wheel; one portable valve facing machine; six portable vises; one portable crane and hoist; one 4-ft. grindstone, belt-driven; one triple head 1½-in. bolt cutter; one 4-in. pipe cutting and threading machine, belt-driven; one 32-in. draw cut shaper, belt driven; one bar shear, capacity 2½ in. rounds, belt-driven; one 80-in. driving wheel lathe; one twist drill grinder; one 3300-lb. steam hammer; one bulldozer; one 2-in. bolt header; one 4790-ft. per min. pressure blower; one 500-lb. belt-driven hammer; three hardening and forging furnaces; one 12-ft. bending roll; one 12-ft. flaying clamp; one 30 x 20-in. timber sizer; one cut-off saw; one 15-in. ripsaw; one universal tenoning and gaining machine.

The list of tools for the Chicago, Burlington & Quincy Railroad is as follows: One 600-ton 90-in. driving wheel press; two 400-ton 50-in. carwheel press; one 10-ft. 6-in. power press; one 30-in. gap, 16-in. stroke bulldozer; one 3-in. upsetting and forging machine; one 36-in. double punch and shear; two 18-in. upright drills; one 60-in. high-power radial drill; one 20-in. upright drill; three double spindle high-speed drills; six 32-in. heavy-duty shapers; one 18-in. heavy-duty single-head slotted; two 32-in. heavy-duty lathes; one 30-in. engine lathe; one 28-in. engine lathe; one 24-in. engine lathe; two 20-in. engine lathes; three 16-in. portable engine lathes; one 16-in. toolroom lathe; three 3 x 36-in. turret lathes; one 24-in. turret lathe; two 42-in. vertical turret lathes; one 84-in. driving wheel lathe; one 54-in. carwheel boring mill; one double screw hoist, 16,000 lb. capacity; one horizontal boring and milling machine; two universal tool grinders; one 2-in. twist drill grinder; one metal bandsaw; six car journal bearing boring machines; two 4-in. pipe threading machines; two 1½ to 2½-in. triple-head bolt cutters; one 1½-in. triple-head bolt cutter; three 42-in. automatic saw sharpeners; one 36-in. ripsaw; one 41-in. bandsaw; one 36-in. hand bending roll; one 10-hp. motor; one 4-kw. motor generator set electro plating outfit; two 250-hp. water-tube boilers.

The list for which bids are invited by the Atchison, Topeka and Santa Fe Railroad, includes the following: One 18-in. x 12-ft. engine lathe; one 250-lb. steam hammer; one 54-in. vertical turning and boring mill; one 42-in. vertical boring

mill; one 16 x 10-ft. engine lathe; one 24 x 16-ft. engine lathe; one 42 x 42 x 18 pattern planer.

Hill, Clarke & Co., 125 North Canal street, Chicago, machinery dealers, have let the contract for the erection of a machinery warehouse at 2100 South Kilbourn avenue, where a four-acre tract has been acquired. It is the intention to construct the best type of building possible for this service. The estimated cost will be \$90,000. The building will be 60 x 360 ft., and will be served by two 25-ton electric traveling cranes.

The Western Plumbing Supply Company, 119 North Deplaines street, Chicago, is planning to build a two-story warehouse to cost \$60,000. J. T. Tyne is president.

Walter Wilson, Chicago, has had plans prepared by the Graham-Burnham Company for a one-story garage 71 x 112 ft., to be erected at Fiftieth street and Cottage Grove avenue at a cost of \$12,000.

J. Nicholson, Chicago, is erecting a one-story factory, 50 x 125 ft., at West Fifty-ninth and Throop streets to cost \$8000.

The Ayer & Lord Tie Company, Chicago, has received an order from the Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa., for 6000 sq. yd. of interior wood block flooring.

The American Tool Works, Chicago, has been organized by Stewart Galt Meikle, Robert Malcolm, LaGrange, Ill., and Grover C. McLaren. It will manufacture tools, dies and metal novelties and has a capital stock of \$10,000.

The American Dredge Company, Chicago, has been formed with a capital of \$5000 by Harry Goodman, 133 West Washington street; William R. Swissler and Harry A. Pillman, to manufacture machinery.

The W. W. Wilcox Mfg. Company, Chicago, maker of metal stampings, has been incorporated with a capital stock of \$15,000 by John H. Harvey, 1735 Armitage avenue; James M. Voorhees and Edward D. Icker.

The Lurie Bolt Company, Chicago, has been incorporated by I. S., William A. and Harry J. Lurie, 69 West Washington street, with a capital stock of \$10,000, to manufacture bolts and locks.

The Quincy Motor Company, Quincy, Ill., has increased its capital stock from \$7000 to \$15,000 and contemplates purchasing new equipment.

Howard Mann has bought a plant at Bradley, Ill., and will manufacture steel specialties. The plant will be thoroughly overhauled and new machinery installed.

Fire in the pattern shop of the Davenport Foundry & Machine Company, Davenport, Iowa, caused a loss of about \$6000.

The Iowa Foundry & Furnace Works, Nevada, Iowa, builder of steel furnaces, contemplates the purchase of some new machinery which will increase its manufacturing capacity. W. J. Heald is president and general manager.

The Ft. Madison Button Company, Ft. Madison, Iowa, is having plans prepared for additions to its plant. The new building will be designed with special attention to sanitation and will be equipped with machinery of latest type.

The Monarch Expansion Bolt Company, Duluth, Minn., has plans for a factory to be built this summer at an approximate cost of \$10,000. W. A. Anton is secretary.

Cleveland

CLEVELAND, OHIO, April 19, 1915.

Two Cleveland builders of turret lathes have taken orders from the Bethlehem Steel Company for 100 machines, and this company is understood to have placed other orders for about 50 turret lathes in the past few days. With this exception no new large war orders are reported, either from domestic sources for making war material or for export. G. M. Haardt, director general of the Mors Automobile Company, Paris, France, was in Cleveland late in the week and placed orders for a number of forging machines and made inquiry for several automatics. The order for the latter is still pending. The domestic demand for other purposes is holding up well in scattered orders for one or two machines. A fair volume of business continues to come from the automobile trade. Automobile tire business has brought out orders for two more boring mills. Following the advance on lathes, some of the makers of high-speed sensitive drills have advanced prices. An improved demand is noted for forging machinery from all sources except the railroads, and a local builder has recently taken several machines for export in addition to those noted above. Molding machines are moving in a very satisfactory manner. Some good additional orders for motor trucks for export have been taken by Cleveland makers. Automobile plants making motor trucks have so much work on hand that they have turned

a good deal of the overflow work over to local machine shops, about all of which have as much work as they can do.

The American Shipbuilding Company has placed a contract with Crowell, Longdorff & Little for a machine and a pattern shop and other buildings, to be erected in connection with its Globe shipyards in Cleveland.

The Kirk-Latty Mfg. Company, Cleveland, Ohio, manufacturer of bolts, rivets, juvenile vehicles, etc., has enlarged its plant by the addition of a warehouse, 50 x 200 ft.

The Independent Tack Company, Cleveland, has arranged to locate its plant in Fostoria, where it will occupy a building formerly occupied by the General Electric Company. The business of this company, together with that of the Standard Galvanizing & Mfg. Company, has been conducted on Canal road, Cleveland, by S. G. Catchpole. The plant was burned recently. The business of the Standard Galvanizing & Mfg. Company probably will be discontinued. In its Fostoria plant the Independent Tack Company will make galvanizing machinery and tacks.

The Advanced Dairy Machinery Company, Canton, Ohio, recently incorporated by Frank Tyson and others, has purchased the plant formerly occupied by the Canton-Hughes Pump Company.

The National Electric Welder Company, Warren, Ohio, has acquired the foundry of the Day-Ward plant in that city, which it will occupy shortly. The new quarters include a building 80 x 200 ft., and sufficient land to permit the erection of other buildings when needed. Some new equipment will be installed.

The Farrell-Cheek Foundry Company, Sandusky, Ohio, has about completed plant additions, doubling the former capacity of its plant.

The Carbo Steel Post Company, Chicago, Ill., has closed a deal with the Cambridge Commercial Club, Cambridge, Ohio, to build its plant in that city.

Norwalk, Ohio, has decided to go ahead with the construction of its municipal electric lighting plant and bids will be taken shortly. H. Whitford Jones & Co., 1303 Citizens' Building, Cleveland, are the contracting engineers.

The Fire Department of Akron, Ohio, will be equipped with a machine shop. Bids for a building extension for the purpose will be received May 1 by Daniel P. Stein, director of public service.

The Essex Glass Company, Mt. Vernon, Ohio, will build a plant at Dunkirk, N. Y., along the Lake Shore Railroad, at an approximate cost of \$45,000. Construction work will be started at once. A. F. Gillie, 47 West Fourth street, Dunkirk, N. Y., is in charge.

Cincinnati

CINCINNATI, OHIO, April 19, 1915

As far as can be ascertained, no letup in the demand for lathes has occurred. Deliveries on popular sizes, however, cannot be promised under three months' time, and in some cases manufacturers are filled up with sufficient business to keep them operating with night shifts longer than this period. A great deal of work is being sublet to firms not building lathes and milling machines, and at the present time practically every machine tool shop in this territory is very busy. Domestic orders continue on the increase, but most of this business is from manufacturers who have orders from abroad for war munitions. The published report as to the intentions of the Pennsylvania Railroad to make large additions to its rolling stock equipment has not been without a good effect. It is generally believed that the railroads will soon commence buying machine tools and other shop equipment.

Manufacturers in this vicinity, who have lately taken on a number of orders for war munitions, have been approached with offers from the same buyers to double the amount of their original purchases. The matter of delivery is said to have caused some firms to hesitate about committing themselves further. As these war orders are now placed with a cash payment in advance, the purchaser naturally insists on guarantees for the delivery of the material at the stipulated time. Machine-tool dealers report an improvement in orders from nearby firms, and lately a number of radial drilling machines have been placed.

Maurice Joseph, of the Joseph Joseph & Brothers Company, Cincinnati, Ohio, confirms the report that the company will establish a large scrap yard at Youngstown, Ohio. It will be up to date in every particular. While the list of equipment has not yet been made up, it is known that several cranes, with and without lifting magnets, will be required, also light and heavy shears, metal cutting saws, motors and a miscellaneous lot of machinery.

The Farguhar Furnace Company, Wilmington, Ohio, has let contract to the Champion Bridge Company of the same place for building an addition to its plant that will be 80 x

160 ft., and of steel construction, for which some special equipment will be required. The company manufactures heating furnaces.

The Miami Brass Foundry Company, Dayton, Ohio, has acquired an additional site adjoining its plant on which it expects to erect a foundry building. Details as to the size of the contemplated addition are not yet available.

Dayton, Ohio, is in the market for a 3,000,000-gal. Corliss pumping engine for its waterworks plant.

The Economy Soap Products Company, Dayton, Ohio, has acquired the old plant of the Dayton Reduction Company and will refit it for the manufacture of soap.

The Solar Metal Products Company, Chicago, Ill., has acquired a site in Columbus, Ohio, and will move its plant to that city. Its present plans include the erection of factory buildings to cost approximately \$50,000, and to be fitted up for the manufacture of metal doors, windows and other sheet-metal specialties.

The Belfont Iron Works Company, Ironton, Ohio, is making an addition to its plant, 120 x 160 ft., of brick and steel construction, to be used for the manufacture of wire fencing.

Henry Hossman, Portsmouth, Ohio, has purchased the idle plant of the Portsmouth Pressed Steel Company, and will fit it up for the manufacture of tanks and blast-furnace equipment.

The Buckeye Aluminum Company, Wooster, Ohio, is making an addition to its power plant.

Fire recently destroyed the junk plant of Ebener & Co., Springfield, Ohio. It will be rebuilt.

Milwaukee

MILWAUKEE, WIS., April 19, 1915.

Industrial centers throughout the interior of Wisconsin report optimistically on business conditions and from some quarters come advices that extensions are under way or being projected because of the increase in orders. The condition is not general, however, and the good feeling in some instances is to be discounted. It cannot be denied, nevertheless, that improvement is going forward and that it is due to a betterment in domestic demand rather than war orders. Conditions in the interior are hardly to be compared with those in Milwaukee. There the comparative vastness of the industry and the necessarily uneven distribution of business can bring forth no good average report on conditions. A Kenosha metal-bed interest is about to expend \$250,000 for seamless steel drawing and electric welding machinery. A large motor company will double its capacity. Wood-working shops are buying a little equipment. Municipalities are in line for fairly good orders for waterworks and power equipment. On the whole, the situation is improving slowly but surely.

The Kewaunee Mfg. Company, Kewaunee, Wis., wood-worker, has contracted with the Giddings & Lewis Mfg. Company, Fond du Lac, Wis., for a Corliss engine and a small list of wood-working equipment.

The Simmons Mfg. Company, Kenosha, Wis., brass and iron bed manufacturer, is about to break ground for an addition affording 180,000 sq. ft. of floor space to accommodate production of a new metal bed designed by John Gall. The addition will cost about \$250,000 and will be devoted to the manufacture of seamless steel tubing and to electric welding operations. Purchases of a large list of automatic machinery of special design are now being made. Otto Rudd is general superintendent.

Cline & Morris, Darlington, Wis., have established a garage and commercial machine shop.

The Harvey Spring & Forging Company, Racine, Wis., has developed a new type of bolster spring for heavy duty vehicles and is now manufacturing it for the market.

E. R. Williams, Winneconne, Wis., is about to erect a garage and machine shop for J. R. Williams and George Richardson, who have formed a partnership.

Sutter, Simpson & Stengel, Spooner, Wis., have awarded contracts for the erection of a fireproof garage and machine shop, 50 x 90 ft., costing about \$5500.

The Waukesha Motor Company, Waukesha, Wis., which has been operating night and day for more than 60 days, is preparing to add a one-story brick and steel building, which will double the capacity of its plant. A production of 3000 motors is planned for the present year. A list of new tool and other shop equipment is now being made.

A new garage costing about \$6500 complete will be erected at Seymour, Wis., by the August Brandt Auto Company, Black Creek, Wis.

Philipp Meyer, Port Washington, Wis., lately associated with the Falls Machine Company, Sheboygan Falls, Wis., has organized the Meyer Mfg. Company and is establishing a

brass foundry in leased quarters on the North-Western Railroad at Sheboygan Falls. The building is now being remodeled.

L. F. Diddie, Marshfield, Wis., is establishing a small plant for the production of a patented lightning rod. The initial capacity of the shop will be 5000 ft. of copper wire cable daily. Louis Tremmel is superintendent.

The village of Melrose, Wis., has adopted a \$10,000 bond issue for the construction of a municipal waterworks and water supply system. W. E. Miller, consulting engineer, Madison, Wis., is preparing plans which will require one 6-hp. gasoline engine, etc.

John Weber, proprietor of the Moor Baths, Waukesha, Wis., has broken ground for a fireproof machine shop, garage and a clubhouse for the Waukesha Golf Club. George Savage will manage the garage. A complete garage equipment will be installed.

The Dodgeville Motor Car Company, Dodgeville, Wis., has leased the machine and blacksmithing shops of J. C. Crase and is remodeling them into a garage. A small equipment of power-driven tools has been purchased. Frederick Hollister will be superintendent.

The Cowell Connecting Devices Corporation, a Minnesota corporation engaged in the manufacture of saddlery hardware, has moved its headquarters to Milwaukee, Wis. Some of its product has been turned out by the Stowell Mfg. & Foundry Company, South Milwaukee. M. R. Cowell is president; A. J. Cowell, vice-president; H. H. Stevens, secretary, and T. H. Gibbons, treasurer. It is likely that it will reincorporate in Wisconsin with a capital stock of \$250,000.

Indianapolis

INDIANAPOLIS, IND., April 19, 1915.

A fire, April 15, in the factory of G. V. Griffith & Son, manufacturer of porch swings, Muncie, Ind., caused a loss of \$5000.

The Inter-State Equipment Company, South Bend, Ind., has been incorporated with \$10,000 capital stock to manufacture machinery. The directors are Adam, Charles A., and G. M. Hunsberger. It will also deal in new and second-hand machinery.

The Kokomo Welding Company, Kokomo, Ind., has been dissolved.

The Grain Machinery Company, North Vernon, Ind., has been incorporated with \$10,000 capital stock to manufacture grain machinery. A. A., D. H., and R. A. Tripp are the directors.

The Rutenberg Motor Company, Logansport, Ind., announces that it has received enough orders to keep the foundry running full time for the remainder of the year.

The Banner Rocks Products Company, Alexandria, Ind., has increased its capital stock from \$50,000 to \$75,000.

The Vocational Supply Company, Muncie, Ind., has been incorporated with \$10,000 capital stock by E. L., F. R. and E. W. Griffith to manufacture tools, etc.

The Anglile Computing Scale Company, Elkhart, Ind., has changed its name to the Indiana Computing Scale Company.

The Plost Post Company, Anderson, Ind., whose plant was recently destroyed by fire, announces that it will rebuild at the earliest possible date.

Lensing Brothers, Evansville, Ind., have been incorporated with \$50,000 capital stock to manufacture builders' supplies. Henry A., W. B. and B. R. Lensing are the incorporators.

The Vincennes Gate Company, Vincennes, Ind., has been incorporated with \$25,000 capital stock by Seymour, M. Riddle, and J. A. Riddle, to manufacture gates.

The Wilhelm Safety Air Hose Coupler Company, Michigan City, Ind., has dissolved.

The Madison Motors Company, Anderson, Ind., has been incorporated with \$500,000 capital stock to manufacture automobiles. The directors are C. E. Gibson, W. E. Moore and O. R. Ewing.

The Chard Lathe Company, Newcastle, Ind., has closed contracts with agencies of three foreign countries for about 100 lathes to be delivered as soon as possible. The force will be largely increased and much new machinery will be needed.

The Special Machinery & Foundry Company, Martinsville, Ind., has been incorporated with \$50,000 capital stock by Harry C. Buschman, C. B. Williamson and C. G. Chase to manufacture machinery.

The Nurre Mirror Plate Company, Bloomington, Ind., will use an electric crane for handling materials in its new plant.

The Central South

LOUISVILLE, KY., April 19, 1915.

Business activity is increasing in this territory, and machinery concerns find trade improving. Inquiries are more numerous, and large jobs, which have been extremely scarce, are also developing, so that the total volume of work, while hardly up to normal, makes a much better showing than it has done. Boiler and tank work continues fairly plentiful, as building operations are sufficiently good to call for a much low-pressure apparatus. The electrical equipment houses are also doing more figuring than heretofore, and have booked some good orders locally the past week. Special machinery is not active, wood-working machines having shown probably more life than anything else on the list.

The Louisville Bridge & Iron Company, has put out specifications calling for 25 alternating current motors with a total capacity of 350 hp.

The Grocers' Biscuit Company, Louisville, has let a contract to the James Clark, Jr., Electric Company for 14 motors with a capacity of 150 hp.

Gamble Brothers, lumber manufacturers, Highland Park, Ky., have decided to operate all of their equipment electrically, and have let a contract to the General Electric Company for a 250-kw. generator and 20 motors.

The plant of the Bickel Asphalt Paving Company, Sixth and A streets, Louisville, was damaged by fire to the extent of \$2500.

The machine shop of the Economy Separable Switch Point Company, Thirtieth and High streets, Louisville, was damaged by fire to the extent of \$2000. W. M. Mitchell is president.

The Hardin Light Company, Hardin, Ky., is in the market for a second-hand Corliss engine of 15 to 20 hp.

The Ideal Motor Company, Hopkinsville, Ky., is building an addition, 42 x 64 ft., to be equipped for repair work. Some machine tools may be needed.

The Chera-Cola Bottling Company, Memphis, Tenn., will expend \$27,000 for power and special equipment for its new plant, which is now under construction. R. L. Hood is president.

Lockwood & Co., 306 Madison avenue, Memphis, Tenn., will build a steel and concrete garage and repair shop to replace that recently burned. Machine tools will be needed.

The Chesterrobe Mfg. Company, Nashville, Tenn., which has been organized with \$20,000 capital stock, will manufacture cedar chests. H. M. Daniel, Gulfport, Miss., is the principal stockholder.

The Nashville Chair Mfg. Company, Nashville, Tenn., has been organized with \$25,000 capital stock and will establish a chair factory. T. F. Bonner, R. S. Crutcher, and others, are stockholders.

W. J. Norris, Buntyn, Tenn., is in the market for a gasoline engine and electric motor for a rural water system.

The H. Wetter Mfg. Company, South Pittsburg, Tenn., whose foundry has not been in operation, has resumed work with a force of 32 molders.

Armour & Co., of Chicago, are reported to have purchased control of the Lookout Refining Company plant at Chattanooga, Tenn., and to have plans for the establishment of a large cold storage plant there in connection with it.

The American Valve Company, Bristol, Tenn., has been organized with \$25,000 capital stock and plans to establish a plant. G. W. Overstreet is secretary and treasurer.

Texas

AUSTIN, TEXAS, April 17, 1915.

Fine spring growing weather has prevailed the past week. An improvement in trade and business conditions generally is noted. A stronger demand for smaller tools and a satisfactory sale of machinery is reported.

The Mitchell Electric Garage & Storage Battery Company, Dallas, has been organized. C. Mitchell is a prominent stockholder.

The Butt-Joint Nestable Culvert Company has opened offices in the Commonwealth Building at Dallas, Tex., and will lease or build, at once, a factory for the manufacture of its patented road culverts. The company is capitalized at \$100,000.

The Southern Farmers' Silo Company, Houston, has been organized with a capital stock of \$20,000 by David A. Weis and others.

Preparations are being made to construct a municipal waterworks plant at Glendale, Ariz. Bonds in the sum of \$50,000 have been issued for the purpose.

The hardwood lumber mill of the Southern Pine Lumber Company, Texarkana, Tex., at Diboll, which was recently destroyed by fire, entailing a loss of about \$90,000, will be rebuilt.

The Seguin Brick & Tile Company, Seguin, will enlarge its plant. It will manufacture interlocking and partition tile, fire-proofing material, building bricks, etc.

The Orient Milling Company, Chillicothe, will enlarge its flour mill from 250 to 400 bbl. daily capacity. It will also build a grain elevator.

The cotton-seed oil mill of the Farmers' Cotton Oil Mill Company, Rogers, which was recently destroyed by fire, will be rebuilt.

The Malone Light & Ice Company, Plainview, has purchased the electric light plant at Lockney from the Lockney Electric Light Company and the electric light plant at Lubbock from the Lubbock Light & Ice Company. It will install new machinery in the two plants and make other improvements.

The Ft. Worth Power & Light Company, Ft. Worth, plans to install an electric lighting system and an ice plant at Springtown.

The Bert Hahn Construction Company, Houston, is building an asphalt crushing plant at Ada, Okla., with a daily capacity of 110 tons. Natural gas will be used for fuel.

The Maloney Tank Company plans to build a plant at Tulsa, Okla., for manufacturing tanks.

St. Louis

ST. LOUIS, Mo., April 19, 1915.

The tendency to hold off from closing machine tool orders continues. The aggregate of business has not decreased; but no such increase as the dealers have been anticipating in their optimism has appeared. The impression prevails that progress upward will be slow here and the Southwest generally until the new crop indicates a better basis for the future. In the meantime caution seems to control, although banks report plenty of idle money and reasonably low rates. Financial circles are timed with relation to new enterprises and the extension of old ones. This necessarily has a dampening effect on the business situation. No lists are appearing. The demand, such as it is, is for single tools. Collections are reported fair, with some improvement over the last report.

The American Shoe Machinery & Tool Company, St. Louis, Mo., has increased its capital from \$20,000 to \$30,000 for the purpose of increasing its capacity.

The International Silo Company, St. Louis, Mo., has been incorporated with a capital stock of \$10,000 by William F. and Charles E. Mounts, William H. Buchanan, Henry H. Fisher and Mark M. Kendall.

The Bleek Automobile Company, St. Louis, Mo., has been incorporated with a capital stock of \$10,000 by John and August M. Bleek and Eugene Herr.

The Bayliss Motors Company, St. Louis, Mo., has been incorporated with a capital stock of \$15,000 by H. G. Ferguson, Bronson Bayliss and Frank Y. Gladney.

The Ferguson Segment Block Company, St. Louis, Mo., has been incorporated with a capital stock of \$50,000 by William C. Ferguson, Ralph S. Rhoads, Augustus H. Stowell and George W. Fowler to manufacture segment sewer blocks, terra cotta, bricks, etc.

The Missouri-Kansas Tank Company will erect a manufacturing plant at St. Joseph, Mo. The company manufactures steel tanks, grain bins and silos.

The Merkle-Hines Machinery Company, Kansas City, Mo., has been incorporated with a capital stock of \$25,000 by E. J. Merkle, G. E. Hines and A. Donovan.

The Continental Furnace Efficiency Company, St. Louis, Mo., has been incorporated with a capital stock of \$15,000 by H. B. Kerruish, M. L. Jennings and William C. Hay to manufacture furnace specialty equipment.

The Young Mfg. Company, St. Louis, Mo., has been incorporated with a capital stock of \$16,000 by Joseph P. Young, John J. Woods and Ernest L. Schroeder to manufacture Kaolin products.

The Laclede Gas Light Company, St. Louis, Mo., will equip a plant in connection with its by-product coke plant for the manufacture of benzol. The first unit to be ready in 90 days will have an annual capacity of 300,000 gal.

The Fuller Lumber Company, Princeton, Mo., has increased its capital stock from \$50,000 to \$125,000 to increase its mill capacity and is reported in the market for the additional equipment.

The cooling building of the Cudahy Packing Company, Kansas City, Mo., was destroyed by fire and explosion April 11 with a loss of \$750,000. It will be replaced.

The Stockton Ice Company, Stockton, Mo., has been incorporated with a capital stock of \$14,200 by A. Willsie, J. W. Craig and W. C. Bryson.

The Alton Grain Elevator Company, Kansas City, Mo., has been incorporated with a capital stock of \$105,000 by E. D. Fisher, E. F. Swinney and W. M. Corbett and will equip an elevator plant.

The American Printing Machinery Company, Kansas City, Mo., has been incorporated with a capital stock of \$12,000 by George R. Strunk, Fred C. Andrews and G. W. Duvall and will equip to manufacture printing machinery.

The Lead Hill Machine & Foundry Company, Springfield, Mo., is in the market for equipment for a plant to be constructed shortly.

Commissioners Nelson Moore, J. M. Hutton and J. C. Rauls, Blytheville, Ark., have in charge arrangements for equipment to do about \$1,700,000 of drainage work.

The J. C. Stephenson Lumber Company, Ashville, Ark., will install wood-working equipment for the manufacture of silos.

O. E. Jacobs, Newport, Ark., will build an addition to his veneer factory.

The Southern Veneer Company, Newport, Ark., has been incorporated with a capital stock of \$150,000 by L. L. Campbell, S. Heinemann, and others, and will build an addition to its plant.

The Choctaw Cement & Lime Company, Hartshorne, Okla., has been incorporated with a capital stock of \$400,000 by S. C. Wingate, N. E. Tuell, Hartshorne, and J. A. Henry, Altus, Okla.

The C. C. Epps Cottonseed & Gin Company, Bristow, Okla., will add equipment for a mill for the manufacture of cotton cake, castor oil, meal, etc.

Marshall, Okla., will expend about \$25,000 on an electric light and waterworks system. The Benham Engineering Company, Oklahoma City, will have charge.

The Poteau Foundry & Machine Company, Poteau, Okla., has been incorporated with a capital stock of \$25,000 by Frank E. Tyler and C. Whalen, Kansas City, Mo., and others.

Cosden & Co., Tulsa, Okla., will increase the pumping capacity of their pipe line from 10,000 to 17,000 bbl. daily.

The Var-Luster Company, Tulsa, Okla., has been incorporated with a capital stock of \$10,000 by A. E. Day, M. E. Day and L. C. Brock to manufacture polishes.

The Right Way Scales & Novelty Corporation, Tulsa, Okla., has been incorporated with a capital stock of \$10,000 by N. L. Brumley and B. Brubacker to manufacture scales, etc.

The Feed Water Heater Company, Tulsa, Okla., has been incorporated with a capital stock of \$100,000 by Floyd A. Sanders, W. C. Currier and J. H. Morgan to manufacture heaters.

The plant of the Corinth Planing Mill Company, Corinth, Miss., which has been burned with a loss of about \$14,000, will be replaced. A. T. Young is manager.

Redrock, Okla., is inviting bids for a waterworks plant to cost about \$22,000. The Benham Engineering Company, Oklahoma City, Okla., has drawn the plans.

F. L. Griffith, Bristow, Okla., is reported in the market for an isolated electric illuminating plant.

The Natchez Fish Company, Natchez, Miss., is in the market for a 30-ton ammonia compressor, one 75-hp. oil engine and other equipment for a refrigerating plant, as well as a deep well power pump and engine connection.

The Vinton Water, Light & Power Company, Vinton, La., will install equipment for a waterworks. Electric generation equipment is also wanted and ice-making machinery. J. G. Sutton is president.

The State Board of Health, Louisiana, has approved a plant for Hammond, La., for the disposal of sewage, to cost about \$38,000. The city commission of Hammond should be addressed.

G. A. Humanson, Shreveport, La., has plans for the equipment of a plant at 812 Bourbon street, New Orleans, La., for the manufacture of fly traps.

The Pacific Northwest

SEATTLE, WASH., April 18, 1915.

According to statistical reports compiled by the West Coast Lumber Manufacturers' Association, 112 mills, with a capacity of 13,757,000 ft., are now running 10 hours a day throughout the Northwest. Approximately 76 mills, with a total capacity of 6,529,000 ft. daily, are not operating at present. It is stated that the curtailment in operation has increased 1½ per cent. since last October. According to the collector of customs, the Puget Sound country is at present exporting

\$100,000,000 of goods annually, a clear increase of more than 100 per cent., as compared with the banner year of 1914, when \$47,000,000 represented the value of exports. A general revival throughout Montana, Idaho and Washington, of all mining industries is noticed in the past few weeks. A number of orders for machinery, in large lots, have been placed in Spokane and Seattle, and development work will begin much earlier than heretofore, due to favorable weather conditions. Collections, while still slow, indicate a gradual improvement that is encouraging to machinery men. Orders for machinery in connection with road work, public utilities construction work, etc., are materializing slowly, although inquiries are numerous.

J. I. Kenny, Port Orchard, Wash., has taken over the machine shop owned by B. Johnson, and will make improvements and additions to it.

The city water system of Ephrata, Wash., has been sold by L. M. Pruitt to F. P. Grover for \$20,000. The new owner will enlarge it.

The Western Sash & Door Company, Portland, will build a small addition to its plant. Plans are now completed, and contract will be awarded soon.

It is announced that the Great Northern Railway Company will build a temporary power plant in Chelan, Wash., this spring, to be used for irrigation purposes and for use when it begins work on the big power dam to be constructed in Lake Chelan.

The Fales-Houston Packing Company, Pocatello, Idaho, recently incorporated by D. W. Fales, R. W. Houston, Gooding; H. E. Walker, Salt Lake City; J. N. McFall, Pocatello, and others, is having plans prepared for the construction of a three-story cement and brick packing plant.

The Charles Simon shingle mill, near Everett, Wash., has been purchased by Frank Cavalero and Peter Carpenter, both of Everett. The new owners plan repairs and the installation of some new machinery.

Foundation work has been started for the cannery plant to be built by Libby, McNeil & Libby, Chicago, at The Dalles, Oregon, at an estimated cost of \$60,000. The building will be 132 x 536 ft., and will be equipped with 300-hp. boiler.

The East Oregon Lumber Company, Enterprise, Oregon, will begin work May 1 on the construction of two band saw-mill, belt driven, with steam power. I. H. Tetty is president.

The \$375,000 water system bond issue voted by Oregon City, Ore., has been validated by Justice Bean, at Salem. Construction work by the contractors, Oregon Engineering & Construction Company, will begin immediately.

The Harvey Mill Company, Ridgefield, Wash., recently filed a mortgage of \$135,000, the proceeds to be used in improvements to its properties.

The Pridham Paper Company, Seattle, will add a 75 x 200 ft. extension and a 31 x 35-ft. masonry boiler house to its mill at Sumner, Wash. Plans have been completed. H. D. Stewart, American Bank Building, Seattle, is the contractor. The work will cost \$20,000.

The Electric Power Switch Control Company, Portland, recently incorporated by Benjamin Erickson, Samuel A. McConnell and Daniel Leatherman, with a capital stock of \$15,000, is reported to plan a plant for the manufacture of an electric switch.

The Hoquiam Sash & Door Company, Hoquiam, Wash., according to report, will move its plant to Montesano, where a larger plant will be erected.

Western Canada

WINNIPEG, MAN., April 16, 1915.

The machinery business has not changed very much; but the outlook seems to be improving as the season advances. Various kinds of repair parts are in fair demand, but the financial conditions are not favorable for industrial expansion. Quietness in the lumber trade is still affecting demand for sawmill machinery throughout western Canada. Prospects for grain elevator and flour mill machinery have improved.

The Vancouver Marble & Tile Company, Ltd., Vancouver, B. C., has suffered a fire loss of about \$10,000, represented principally by marble-cutting machinery.

Redcliff, Alberta, is preparing to spend \$35,000 on its waterworks plant.

G. S. Richards, Fourteenth avenue, East, Vancouver, B. C., is planning to build in the Fraser Valley, B. C., a small mill for manufacturing ties.

The Laminated Materials Company, 35 Congress street, Boston, Mass., has leased the Dominion match factory at Snapperton, New Westminster, B. C., and will engage in box-making there.

Eastern Canada

TORONTO, ONT., April 19, 1915.

The plant of the Canadian Car & Foundry Company, Ltd., Amherst, N. S., is to be equipped with machinery for the manufacture of shrapnel shells and other war materials. The company recently received a large order for shells from the British Government.

The main factory of the Bryan Mfg. Company's wood-working plant, Collingwood, Ont., has been destroyed by fire with a loss of \$100,000.

The Laurentide Company, Ltd., Montreal, has made arrangements for securing \$1,000,000 necessary for the completion of its paper-making plant at Grand Mere, Que.

Estimates for new dredging plants to the amount of \$2,267,000 were adopted by the House of Commons the other day, including a vote of \$871,000 for the construction and completion of a plant for dredging the St. Lawrence River from Montreal to Father Point. Robert Rogers, Ottawa, is Minister of Public Works.

Walter Brown, Beebe Junction, Que., is to erect a sash and door factory at a cost of \$5000, to take the place of one recently destroyed by fire.

The Canada Bread Company's building at Chesley, Ont., is to be turned into a factory for the manufacture of shrapnel shells.

Hamilton, Ont., will receive tenders up to April 27 for one centrifugal pump of 8,000,000 gal. capacity and one synchronous motor of 150 hp., with accessories, for the Gage avenue sewage pumping station. A. F. Macallum, Hamilton, is city engineer.

Ottawa, Ont., is in the market for an electrically operated pumping unit. Tenders close May 12. The city engineer will supply specifications.

A new industry for the manufacture of various kinds of wood products is to be established at Preston, Ont. The name of the concern is the Preston Mills Company, Ltd.

Fire destroyed the lumber mill of John Piggot & Sons, Windsor, Ont., on April 14, with a loss of \$40,000.

The barrel factory of the Acadia Sugar Refinery Company, Halifax, N. S., has been destroyed by fire with a loss of \$6500.

The plant of the Canadian Wolverine Company, manufacturer of plumbers' supplies, Chatham, Ont., has been destroyed by fire.

The Grasselli Chemical Company, Hamilton, Ont., is to make an addition to its plant at a cost of \$100,000.

An addition is to be made to the factory of the F. E. Coombe Furniture Company, Ltd., Kincardine, Ont.

The T. Eaton Company, Toronto, proposes to erect a factory at Mt. Dennis, Ont.

Toronto, Ont., is in the market for a boiler for its stone-crushing plant. R. C. Harris is works commissioner.

Verdun, Que., is to expend \$50,000 for the extension of its waterworks and electric lighting system. Henry Hadley, Jr., is city engineer.

Canada Steam Furnaces, Ltd., Toronto, has been incorporated with a capital stock of \$150,000 to manufacture steam and other furnaces. Joseph Dennis, William D. Wilson and Thomas S. Elmore, all of Toronto, are the incorporators.

Meriden Britannia Company, Ltd., Hamilton, Ont., has been incorporated with a capital of \$400,000 to manufacture articles of silver, nickel, copper, steel, iron and porcelain. The incorporators are George H. Wilcox and George M. Curtis, Meriden, Conn.; William K. George, Toronto; James W. Millard and John G. Gauld, both of Hamilton.

Shawinigan Electro-Metals Company, Ltd., Montreal, has been incorporated with a capital stock of \$50,000 to manufacture metals, minerals, etc., by Howard Murry, Theophilus H. Wardleworth, William S. Hart, Julian C. Smith and Alfred Stansfield, all of Montreal.

The Rideau Power Company, Ltd., Merrickville, Ont., has been incorporated with a capital stock of \$80,000. The incorporators are Thomas G. Kyle, Robert W. Watchorn, Thomas J. Watchorn, Abraham L. Mills and Alexander Mills.

A plant for the manufacture of engines and boilers, and for metal drawing, stamping and forging, is to be erected at St. Catharines, Ont., by the Metal Drawing Company, Ltd., recently incorporated with a capitalization of \$50,000, by George D. Burson and H. Shortt.

A factory for the manufacture of motor cars and bicycles is to be built at Berlin, Ont., by the Canadian Regal Motor Company, Ltd., recently incorporated by H. Nyberg, Alexander H. Miller, and others, with a capital stock of \$100,000.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

ACCUSATION OF PATENT INFRINGEMENT AS LIBEL.—Before a manufacturer will be held liable in damages as for libel in writing a statement that a rival's product constitutes an infringement of his, the latter must show, not merely that there was no infringement, but that defendant knew that the statement was false, for the statement, if innocently and honestly made, would not be libelous. In a suit to recover such damages, plaintiff must show that he has sustained special damage through the statement before there can be any substantial recovery. (New York Supreme Court, Wittemann Brothers vs. Wittemann Company, 151 New York Supplement 813.)

NEGLIGENT FOUNDRY PRACTICE.—An employer is liable for injury to a molder, caused while pouring molten iron into a mold clamped about tubing on a metal bed for the purpose of making an ornamental enlargement thereon, through a blowout occurring in the chill, whereby the molten metal was forcibly ejected and thrown in the molder's face, if, on account of moist and rusty condition, the tubing was apt to cause a blowout, and if it appears that he did his work in a reasonably careful manner. (Wisconsin Supreme Court, Pauloni vs. Simons Mfg. Company, 151 Northwestern Reporter 265.)

TIME FOR PERFORMING CONTRACT.—NECESSITY FOR TENDER.—If a contract for installation of machinery in a manufacturing plant does not specify any time for performance of the agreement, the seller has a reasonable time in which to comply with the contract. What is a reasonable time depends upon the facts of each particular case. When one who has contracted for drawings and license to be furnished him for the construction and operation of patented apparatus has repudiated the agreement and stated that he will not accept delivery, the other party is not bound to make a tender of delivery as a condition precedent to suing to recover damages for breach of the agreement. (United States Circuit Court of Appeals, Second Circuit, Allegheny Valley Brick Company vs. C. W. Raymond Company, 219 Federal Reporter 477.)

REVOCAION OF PATENT LICENSE CONTRACTS.—The fact that an inventor of improvements in mechanical stokers, after granting a license to a foundry company to manufacture stokers covered by his patents, violated his contract with the company by competing with it does not necessarily preclude him from enforcing a rescission of the license for subsequent breaches of the contract on the part of the company. A violation of such a contract, in order to sustain a rescission by the aggrieved party, must go to a vital part of the contract, and not to some incidental matter which can readily be compensated in damages. Suspension by a licensee of manufacture of patented articles, in violation of his contract and to the loss of the patentee in the matter of royalties, justifies the latter in terminating the contract. (United States Circuit Court of Appeals, Third Circuit; Oscar Barnett Foundry Company vs. Crowe, 219 Federal Reporter 450.)

NOTICE OF INJURY UNDER NEW YORK LABOR LAW.—The requirement of the New York labor law that an employee suing under that act for personal injury received while in the service of a corporation shall deliver or mail notice of the injury at the company's principal office or place of business, if it has one in the State, is not complied with by delivering the notice at a branch office of the company, although the notice may come to the attention of the proper corporate officers. (United States Circuit Court of Appeals, Second Circuit, Mason & Hanger Company vs. Sharon, 219 Federal Reporter 526.)

CONDITIONAL SALE CONTRACTS IN NEW JERSEY.—Under the laws of New Jersey when machinery is delivered to one who has contracted to buy it, the title passes to him, as against his judgment creditors, unless the contract, containing a reservation of title in the seller until payment of the price, is recorded. A contract, purporting to "lease" machinery in consideration of the payment in monthly installments of an amount at

which the machinery is valued by the parties, and containing a provision to the effect that a bill of sale will be given the lessee on completing the payments, is a contract of conditional sale and not a lease. (United States District Court, District of New Jersey, *in re Vandewater & Co.*, 219 Federal Reporter 627.)

INFRINGEMENT OF TRADE NAMES.—A manufacturer who innocently adopts a name for his products, without knowing that the same name has been previously adopted, but not registered by, a competitor, should not be enjoined against further use where there is nothing to show that he has simulated the dress of the latter's product or attempted in any way to palm off his goods as those produced by the other manufacturer. But a showing that the first-mentioned manufacturer's agents have induced sales by leading the purchasers to believe that they were getting the other manufacturer's product entitles the latter to damages and injunctive relief. Fraud is not an essential element of infringement of a registered trademark, but it must be shown to establish a case of unfair competition such as is remediable in the courts. (United States Circuit Court of Appeals, Seventh Circuit, Keystone Oil & Mfg. Company vs. Buzby, 219 Federal Reporter 473.)

WHEN MACHINERY IS NOT WARRANTED BY SELLER.—When a machine is constructed according to definite plans and specifications, the manufacturer makes no implied warranty that the machine will perform the functions for which it is bought. Compliance with the specifications is all that is required of him. Hence, a purchaser of a hoisting engine which was manufactured under such a contract cannot defeat liability for the agreed price by showing that the engine could not develop the power necessary to operate the hoist. (Washington Supreme Court, Mianus Motor Works vs. Volans, 145 Pacific Reporter 997.)

BUYER'S RIGHTS ON MISREPRESENTATION OF MACHINERY.—When machinery sold fails to come up to the representations under which it was sold, the buyer has a choice of two remedies, namely, by acting promptly, he may elect to rescind the contract, or he may claim damages resulting to him through breach of the contract. But, if he chooses the first remedy, he must return or offer to return everything that he has received under the purchase. (New York Supreme Court, Hedges vs. Pioneer Iron Company, 151 New York Supplement 495.)

WHAT CONSTITUTES "STOCK IN TRADE."—A law in force in New Hampshire provides that "stock in trade, whether of merchants, shopkeepers, mechanics or tradesmen, employed in their trade or business," is liable to be taxed, and provides that for the purposes of taxation raw materials and manufactures, etc., shall be deemed stock in trade. Held, that this law is intended to reach only such property as is employed by merchants, etc., in their trade or business. "By a merchant, as that term is ordinarily used, is intended a person whose business or occupation is buying and selling commodities. Although every merchant buys and sells commodities, the converse of this proposition is not true, for but very few of those who buy and sell commodities are merchants. Every producer buys and sells commodities, but producers are not merchants within the ordinary meaning of that term. On the one hand, they buy commodities to use in their business, while merchants buy them to sell again. On the other hand, they produce, while merchants buy, the commodities they sell." To determine the validity of a tax levied under the law above mentioned, the test is to determine the character of the owner's business. If he is a dealer in the particular commodities which are carried in stock, they are taxable. If, however, he bought them, not to sell, but for use in his business, they are not taxable as stock in trade. (New Hampshire Supreme Court, White Mountain Fur Company vs. Town of Whitefield, 91 Atlantic Reporter 870.)

PRICE RECOVERABLE FOR MANUFACTURING MACHINERY.—A company which constructed machinery under a contract that fixed no price for the work is entitled to recover the reasonable value of the machinery. (Washington Supreme Court, Nordeen Iron Works vs. Rucker, 145 Pacific Reporter 219.)

Trade Publications

Ball and Roller Bearings.—Bantam Anti-Friction Company, Bantam, Conn. Catalogue. Is a unique exposition of many types of ball and roller bearings for a wide range of loads and speeds including data sheets to assist the draftsman who designs and lays out bearings. The appendix contains a reprint of an exhaustive treatise on ball and roller bearings. The entire catalogue is illustrated.

Anvils and Vises.—Fisher & Norris, Trenton, N. J. Catalogue No. 30. Pertains to a line of anvils for use in blacksmith shops and by saw, chain and plow makers. The vises are of the double screw parallel leg, machinists' and quick action lever types. Tables of the different sizes that can be supplied serve to supplement the text descriptions of the different anvils and vises. Mention is made of swage blocks and stands and cast-iron anvil stands.

Grease Cups.—Automatic Grease Cup Company, 217 North Fifteenth street, Philadelphia, Pa. Folder. Illustrates an automatic grease cup, in which the feed is secured by compressed air supplemented by a light spring. The construction and use of these cups, which are intended for employment on all rapidly moving or rotating parts such as loose pulleys or where dirt or grit is present as in automobiles, emery grinding machines, etc., are described at some length with a table of the sizes in which the cups can be furnished.

Steam Traps.—Automatic Steam Trap & Specialty Company, 316 Harper avenue, Detroit, Mich. Catalogue No. 8. Discusses the construction of the Barton steam trap with especial emphasis on its simplicity of parts. The use of the trap in marine work is touched upon and illustrations of traps on steamers and testimonials are included.

Model Loft Buildings.—Bush Terminal Company, 100 Broad street, New York City. Booklet. Describes the company's loft buildings on the South Brooklyn water front, which are operated in connection with the Bush freight terminals. These lofts are rented with power to manufacturers, and tenants have the benefit of a harbor lighterage service in connection with the use of piers, warehouses and railroad terminal yards. The lofts have the advantage of direct track connection with the terminal acting for trunk lines, which eliminates cartage on railroad shipments. The buildings in use at present are described, a list of tenants given and the labor market and future development of the locality and projected buildings discussed. There is also a list of connecting railroad and steamship lines, map, etc.

Pressure Regulators.—Locke Regulator Company, Salem, Mass. Catalogue N. Gives illustrations with brief descriptions of a line of regulating devices for the conduct and control of steam and water pressure. These include a hydraulic damper regulator, a combination pressure regulator; non-return, reducing and differential valves; pump governors, etc.

Woven Steel Hose.—Woven Steel Hose & Rubber Company, Trenton, N. J. Catalogue No. 14. Describes and illustrates types of flexible woven steel armored hose for pneumatic tools, air drills, oxy-acetylene apparatus and steam and oil lines together with various kinds of metal and woven hose armor, rubber and conveyor belting and hose couplings. Steam, air and sheet packing; pump valves and brake linings are also taken up. Illustrations of the hose in use are included as well as a price list and a comprehensive index.

Measuring Devices, Gauges and Machine Tools.—J. M. Rogers Works, Gloucester City, N. J. Catalogue No. 8. Contains illustrations and descriptions of fixed caliper gauges, external and internal limit gauges, measuring machines, reference disks and corrective gauge standards. The line of machine tools includes thread cutting tools; adjustable blade, shell and chucking reamers; special reamers, mandrels, arbors, etc.

Refractories.—Harbison-Walker Refractories Company, Pittsburgh, Pa. Catalogue. Size, 4x6 $\frac{1}{2}$ in.; pages, 160. The catalogue is published in the style and size of the well-known engineering handbooks and contains a complete treatment of silica, magnesia, chrome and fireclay bricks and various refractories for use in blast, malleable and open-hearth furnaces, cupolas, coke ovens and boilers. Especial attention is given to coke oven brick and its use in the longitudinal type of oven. Standard shapes of brick are shown in colors and the adaptations of the various shapes explained. The several types of furnaces and ovens are shown in detail. A valuable feature of the catalogue is a set of tables for the construction of circles and arches from the combinations of standard firebrick.

Steel Plate and Plexiform Fans.—Bayley Mfg. Company, Chicago, Ill. Catalogue No. 14. Illustrates a line of blowers for cupolas and exhaust, ventilating and drying fans for belt, engine, motor and turbine drive. Details of con-

struction and illustrations of the different parts, especially parts of plexiform fans are presented. Capacity and dimension tables are included.

Gasoline, Kerosene and Gas Engines.—G. D. Pohl Mfg. Company, Vernon, N. Y. Catalogue No. 21 and collection of folders. Cover a type of four-cycle throttling governor, single and twin horizontal-cylinder, gasoline, kerosene and gas engines built in stationary, portable and semi-portable types. Details of design and construction are shown by cross-sections and diagrams. One folder takes up heavy-duty double-acting tandem gas engines with illustrations and diagrams showing the arrangement of the various parts. Another folder describes oil engines and a third is devoted to producer gas engines with a comparative fuel cost table.

Hand Power Elevators.—Storm Mfg. Company, 10 Vesey street, Newark, N. J. Catalogue and folder. Descriptive of a line of passenger and hand power freight elevators and ash hoists up to 6000 lb. capacity. Views of the different types of hoisting mechanism are included with brief description of their special features. Mention is also made of electric dumb-waiters with either electrical or mechanical control.

Rocking, Dumping and Stationary Grates.—Kelly Foundry & Machine Company, Goshen, Ind. Catalogues C and G. Illustrates a wide range of rocking and dumping grates for boilers and furnaces, portable kiln and stationary grates and boiler fronts. In the former the grates are shown in operation to dump either all or a portion of the fire bed. The different parts are described with directions for the installation and care of grates. Catalogue G is given over to boiler fronts and accessories for boilers and grates and is profusely illustrated.

Spiral-Riveted Pipe and Water Tube Boilers.—Abendroth & Root Mfg. Company, Newburgh, N. Y. Handbook No. 41. Discusses the construction of spiral-riveted pipe with especial emphasis on the flanged joint which is claimed to be absolutely tight and the rigidity of spiral and straight seam riveted pipe is compared. Bolted joints and tapping connections are explained and illustrated. Water tube boilers are mentioned and hydraulic mining equipment is given some space. An exhaustive and detailed price list and some testimonials complete the handbook.

Hot Water Heaters.—National Pipe Bending Company, New Haven, Conn. Booklet. Is an attractive series of blueprints setting forth the details of the construction of the various types of heaters for use in factories, office buildings and mills. In addition to explaining the construction, model systems are shown.

Engines and Power Machinery.—Robert Wetherill & Co., Chester, Pa. Bulletin G. A camera-catalogue showing illustrations of engines, plunger and electric elevators for passenger and freight service, pumping engines, boilers, feed water heaters, etc. Views of the foundry, erecting and assembling departments of the plant and of buildings where Wetherill products are in use are included, there being no descriptive matter.

Automatic Sprinklers.—Automatic Sprinkler Company of America, 123 William street, New York City. Booklet. Discusses the problem of fire protection for factories, warehouses and offices and pays particular attention to the results obtained through the use of the Automatic system. The equipment is illustrated and diagrams of piping layouts are given. Much of the booklet is given over to testimonials from plants where this system is in use, and illustrations of some of these are included.

Motor Trucks.—DeKalb Wagon Company, DeKalb, Ill. Catalogue No. 5. Contains detailed description and illustrations of the engine, method of transmission, chassis and body of the several types of trucks for commercial purposes. Illustrations show the various uses to which DeKalb cars may be put. Another feature of the catalogue is a table comparing the cost of operation of these cars with horse-drawn vehicles.

Waterworks Supplies.—Loetzer Valve & Mfg. Company, Monroeton, Pa. Catalogue. Contains description and illustrations of Loetzer compression fire hydrants, double gate valves, street valve boxes, automatic air and vacuum valves, mounted melting furnaces and lead pots, ladies, portable hand power cranes, etc.

Electric Furnaces.—Snyder Electric Furnace Company, 53 West Jackson boulevard, Chicago, Ill. Bulletins Nos. 1027 and 1030. The first calls attention to the low cost of electric steel produced in the furnaces of this company and cites figures taken from furnaces in actual operation. The second bulletin embodies a brief historical account of the development of the electric furnace from 1880 to the present time with a description of the construction and operation of the Snyder electric furnace. The text description is supplemented by numerous illustrations of the various parts of the furnace and the furnaces themselves. An illustration of test bars poured from steel made in the furnace and a table of operating costs are included.